PATENTS: JUDICIAL DEVELOPMENTS AND LEGISLATIVE PROPOSALS*

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THERE are some things about the patent system that can never be known as fully and directly as one might desire, e.g., whether or not it has operated on the whole to retard technological development in the United States. On the other hand, there are many important things about the patent system that can be and are known. The system has been in operation for over 150 years, and in that time it has produced, as a glance at the digest of federal cases will show, more litigation than any other subject of federal jurisdiction except taxation and bankruptcy. From an examination of some of this litigation and consideration of the nature of science, technology, and invention, it appears that the subject matter is such as to make a fair decision in any vigorously disputed case concerning priority, validity, or scope of invention extremely difficult, if not impossible. This is true, in brief, because in an extremely significant sense, there is seldom *an* invention or *a single* inventor. In its attempt to grant rewards to single inventors for single inventions, therefore, the patent system seems to have essayed the impossible. And from this attempt a multitude of evils have resulted.

One can also know that the patent system has been one of the principal factors in the growth of private monopoly power in the United States. For this there is sufficient proof in the reported cases and in the facts that have come to light in recent years. On the premise that monopoly power tends to inhibit the vigor which competition tends to stimulate, it is possible to conclude that the patent system, since it is in large measure responsible for our monopolies, has inhibited industrial growth and socially desirable exploitation of invention. Such unfortunate consequences of the patent system, and many others, are treated in some detail in the body of this paper. An attempt is here made to trace a kind of natural history of the patent system and to place it in its living position in the economy of which it is an extremely important part.

One of the most sacred of contemporary sacred cows, the patent system has had no significant legislative alteration in more than a hundred years.

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The same can be said of other vital politico-economic institutions. And the net result has been a radical departure of political and economic fact from the political and economic theory which is often said to dominate American thinking. Ridiculously fearful lest the national government should become too powerful, we have allowed, and even forced, private groups to assume power and authority far beyond the danger point. This is as true with respect to patents as it is, for example, with respect to corporations and labor unions. Several proposals for reform of the patent system have been submitted recently. A political theory is premised in this paper, and the proposals are examined against that theory.

I

"These extracts from Court decisions have been given at some length with the thought that, by giving the reader, interested in modern telephony, an opportunity to read the language used in them, he can perhaps, better than in any other way, form a conception of the nature of the litigation that finally resulted in Alexander Graham Bell being fully sustained as the inventor of the telephone." This statement ends chapter iv of the book, *Beginnings of Telephony* (1929), written by Frederick Leland Rhodes, an electrical engineer employed by the American Telephone & Telegraph Company. While Mr. Rhodes did quote at length from various inferior federal court decisions, the quotations were selected in a manner which reveals that the devices commonly associated with the lawyer are not unknown to other engineers. For one thing, Mr. Rhodes avoids any emphasis of the most important decision in the whole telephone-patents controversy, the only Supreme Court case which takes up a full volume of the reports. And he fails completely to mention that that decision, upholding the Bell patents, went by a four to three majority, with Associate Justices Field, Bradley, and Harlan dissenting.¹

The quotations employed by Mr. Rhodes and the general slant of his exposition give a one-sided picture of the telephone-patents controversy—a picture in which the doubtful aspects of the litigation and final settlement are minimized, when they are mentioned at all. The facts in the controversy here recounted are presented primarily to provide insight into the operation of the American patent system. If the narrative tends to cast doubt upon the validity of Bell's claim to fame as the sole and original inventor of the telephone, that result is simply an unfortunate by-product of an attempt to show that the patent system, by purporting to

¹ The Telephone Cases, 126 U.S. 1-584 (1888). Involving several parties, the cases nevertheless revolved around one issue—whether or not the patents granted to Alexander Graham Bell were valid.

grant exclusive rewards for inventions, has essayed a task which events seem to prove impossible of execution without consequent confusion, conflict, and litigation extensive enough in themselves to induce grave question as to the net worth of the system. The telephone controversy arose from no peculiarly complex technological problems. More abstruse problems arise daily in the Patent Office, and they cause the same kind of trouble. The telephone controversy is chosen for description here simply because more of the facts are available and because the lapse of years affords a perspective for evaluation of the labors involved in establishing the rights granted by the Patent Office.

On February 14, 1876, Alexander Graham Bell filed with the United States Patent Office an application for a patent on "certain new and useful Improvements in Telegraphy." On the same day, Elisha Gray filed a *caveat* (a notice of an invention not yet completed) which begins as follows:

Be it known that I, Elisha Gray, of Chicago, have invented a new art of transmitting vocal sounds telegraphically. . . . It is the object of my invention to transmit the tones of the human voice through a telegraphic circuit, and reproduce them at the receiving end of the line, so that actual conversations can be carried on by persons at long distances apart.

"To attain the objects of my invention," Gray's *caveat* continues, "I devised an instrument capable of vibrating responsively to all the tones of the human voice, and by which they are rendered audible."²

In contrast to Gray's deliberate and forthright statement of the intention to transmit speech, Bell's application nowhere speaks of transmitting speech; it is preoccupied with the problems of transmitting multiple telegraphic signals over a single wire, although it clearly appears from Bell's statements that the *possibility* of transmitting other sounds, including the sound of the human voice, was recognized by him. The relevant portions of Bell's application are as follows:

The duration of the sound may be used to indicate the dot or dash of the Morse alphabet, and thus a telegraphic despatch may be indicated by alternately interrupting and renewing the sound. . . .

I desire here to remark that there are many other uses to which these instruments may be put, such as the simultaneous transmission of musical notes, differing in loudness as well as in pitch, and the telegraphic transmission of noises or sounds of any kind.

One of the ways in which the armature *c* Fig. 5, may be set in vibration has been stated above to be by wind. Another mode is shown in Fig. 7, whereby motion can be imparted to the armature by the human voice or by means of a musical instrument.

² 126 U.S. 1, 78-80 (1888).

In the last paragraph of his application, Bell claimed "The method of, and apparatus for, transmitting vocal or other sounds telegraphically, as herein described, by causing electrical undulations, similar in form to the vibrations of the air accompanying the said vocal or other sounds, substantially as set forth."³

There is a very simple reason why Bell may have adopted such a hedging tone in his application: He had never been able, prior to the date of his application, to transmit speech with his device. (Neither, for that matter, had Gray.) The famed "Mr. Watson, come here; I want you" was not accomplished until March 10, 1876—three days after a patent was issued on the application of February 14, 1876.

This leads one to wonder why Bell should have applied for a patent when and as he did—when his lack of success in transmitting speech made it necessary for him to make his claim in such an ambiguous way. One possible explanation for Bell's conduct lies, of course, in the fact that he was aware that others were working in telephony. He knew, for example, that Gray was also working in the field. In a letter of August 14, 1875, written to one of his backers, Bell asked: "Don't you think it would be well to take out a caveat for the use of the magneto-electric current? In its present undeveloped state, it might be unwise to let Gray know anything about it, unless, indeed, we could secure the principle of it in a patent."⁴ There were, and had been for some time, moreover, a number of other people working on the application of Faraday's principles of electro-magnetic induction to the problem of transmitting speech by wire. One example of the thinking in the field was published by M. Charles Bourseul in 1854—twenty-two years before Bell's patent was issued. After discussing the applications of Faraday's principle to telegraphy, and speculating on further phenomena made possible by electro-magnetic induction, Bourseul went on:

I have asked myself, for example, if the spoken word itself could not be transmitted by electricity; in a word, if what was spoken in Vienna may not be heard in Paris? The thing is practicable in this way:

We know that sounds are made by vibrations, and are made sensible to the ear by the same vibrations, which are reproduced by the intervening medium. But the intensity of the vibrations diminishes very rapidly with the distance; so that even with the aid of speaking tubes and trumpets, it is impossible to exceed somewhat narrow limits. Suppose that a man speaks near a movable disk, sufficiently flexible to lose none of the vibrations of the voice; that this disk alternately makes and breaks the connection with a battery; you may have at a distance another disk which will simultaneously execute the same vibrations.⁵

³ Ibid., at 6-14.

⁴ Printed, *ibid.*, at 218.

⁵ Reprinted, *ibid.*, at 31-2.

Thus, acquaintance with Gray's work and other developments following Bourseul may account completely for Bell's haste and the ambiguity of his application of February 14, 1876.

But Bell and his backers were accused of more sinister conduct. In an action brought by the Government for annulment of the Bell patents charges were made that Bell's researches and experiments warranted an application covering, as his actually stated, *only* "Improvements in Telegraphy." The Government contended that Bell could not originally have had reference to a patent covering the transmission of speech, simply because he had never transmitted speech as of the date of his application. It charged, moreover, that those parts of Bell's application which were held to cover the art of transmitting speech were not a part of the original application, but were inserted only after employees of the Patent Office illegally revealed to him the methods and objects of Gray's *caveat*.⁶ Bell then proceeded, according to the Government's complaint, "to make substantial amendments of his . . . specification and claims."⁷ And these amendments, the Government charged, "related to those parts of . . . Bell's alleged invention which he and his assigns have since claimed as the cardinal element and feature of his patent."⁸ The Bell patent was issued on March 7, 1876, just three weeks after his application had arrived in the Patent Office simultaneously with Gray's *caveat*. This speed of issuance is the more remarkable in view of the fact that an interference had been declared between Bell and Gray. The Government charged, on this score, that Bell's patent was issued with "undue and unusual haste, and without proper consideration and in violation of the rights secured by . . . Gray, or of the rights and interests of the citizens of the United States, with respect to the art of telephony. . . ."⁹

Whether or not these charges were founded in fact is impossible to say; there is not even a final judicial opinion on the matter, since, while the charges were made in a formal action by the Government, the case was never finally adjudicated. Having traveled up and down the judicial hierarchy on the question of whether the Government has a right to an action for annulment of a patent, and having hit several other snags on the district court level, the case was dropped in 1896—after the disputed patents had expired and counsel in charge of the Government's case had died.¹⁰ In fairness to Bell it should be added that the Supreme Court did

⁶ United States v. Bell Telephone Co., 128 U.S. 315, 316-20 (1888).

⁷ Ibid., at 320.

⁸ Ibid.

⁹ Ibid.

¹⁰ See the volume published by the American Bell Telephone Company, entitled, *The Deposition of Alexander Graham Bell in the Suit Brought by the United States To Annul the Bell Patents*, at p. 2 (1908).

pass in *The Telephone Cases* on part of the charges made by the Government. Presented with some of the charges by private litigants, the Court held the evidence which tended to support them "not sufficient to brand Bell and his attorney and the officers of the Patent Office with that infamy which the charges made against them imply."¹¹

Writers sympathetic with the Bell System have contended that the Government was prevailed upon, through political influence, to bring the action for annulment. Mr. Rhodes, for example, stating that the suit was instigated by the Pan Electric Telephone Company, points out that Pan Electric's board of directors included two United States Senators and that its counsel was Attorney General when the action was brought.¹² Herbert N. Casson, paid by A.T.&T. to write *The History of the Telephone*,¹³ said in that book that Bell's rivals

next planned to get through politics what they could not get through law; they induced the Government to bring suit for the annulment of the Bell patents. It was a bold and desperate move, and enabled the promoters of paper companies to sell stock for several years longer. The whole dispute was re-opened, from Gray to Drawbaugh. Every battle was re-fought; and in the end, of course, the Government officials learned that they were being used to pull telephone chestnuts out of the fire. The case was allowed to die a natural death, and was informally dropped in 1896.¹⁴

Although it seems obvious that he has treated the Government's case cavalierly, it is unnecessary to take issue with Casson. Similarly, Rhodes's insinuations may be left un rebutted. For present purposes it *is* necessary, however, to note that the Government's case was instituted in 1886, two years before some of the charges in its complaint were rejected by the Supreme Court, when those charges were brought by private litigants.¹⁵ Now, there are at least six reported opinions on one or another aspect of the Government's case,¹⁶ and, while this ten-year proceeding may have been a "bold and desperate move," as Casson asserts, the fact remains that it was made possible and plausible by the inherent character of the patent system. The queer wording of Bell's application of February 14, 1876, even if it be construed most favorably to Bell, is the type of thing

¹¹ 126 U.S. 1, 570 (1888).

¹² Rhodes, *Beginnings of Telephony* 70-75 (1929).

¹³ See Danielian, *A.T.&T.: The Story of Industrial Conquest* 292-93 (1939).

¹⁴ Casson, *The History of the Telephone* 99-100 (1910).

¹⁵ The first hearing reported was *United States v. American Bell Telephone Co.*, 29 Fed. 17 (D.C., Ohio, 1886).

¹⁶ *United States v. American Bell Telephone Co.*, 29 Fed. 17 (D.C., Ohio, 1886); same, 30 Fed. 523 (C.C., Mass., 1887); same, 32 Fed. 591 (C.C., Mass. 1887); same, 128 U.S. 315 (1888); same, 39 Fed. 230 (C.C., Mass., 1889); same, 39 Fed. 716 (C.C., Mass., 1889).

inevitably provoked by the patent system's holding out an exclusive reward for inventions to one inventor. Since technological advance proceeds from the findings of "pure" scientific research, which are available to anyone interested, and since there are usually many men working on the practical application of known principles, under the patent system conflict between inventors similarly engaged is therefore inevitable. Again, the character of scientific research and technological application is such that the problem of carving out a particular development and labeling it an invention for which a patent should be issued, cannot help creating confusion and conflict. As Bell's experience indicates—regardless of how it be construed—it is often impossible to predict what developments may accrue from a given process or device. It is no answer to say that the first applicant should be given a monopoly right to every conceivable practical application of his device, for that is substantially what happens under the present patent system; and it is precisely that "solution" which creates the uncertainty, confusion, and, finally, the overwhelming litigation, of which we have had only a small sample thus far in this investigation of the telephone controversy.

As of 1910, when Casson published his book, he reported that the Telephone Company had been involved in 587 lawsuits, and his comment thereupon was that its experience was "an unanswerable indictment of our system of protecting inventors."¹⁷ This comment, like so many in Casson's book, is important more for what it implies than for what it states—and again like other statements in the book, it covers over more facts than it reveals. The comment implies that the patent system has no trouble establishing inventorship; at least that it had no trouble establishing Bell's. Indeed, Casson seems occupied primarily with allaying any doubts which might exist or arise concerning the justice of awarding to Bell the sole and exclusive right in telephony. And his method, common with such writers, is that of repetition, garlanded with poetry and bare of fact. According to Casson, Bell was the "original inventor," the "sole inventor," and the "first cause" of the telephone. "There was no telephone until [Bell] made one," Casson asserts.¹⁸ "He invented it first, and alone."¹⁹ It was only after Bell's telephone achieved popular success that rival claimants appeared, Casson complains, and "the forgetful public came to believe that the telephone, like most inventions, was the product of many minds."²⁰

Now the sale (or lease) of the first telephone occurred on May 10,

¹⁷ Casson, *The History of the Telephone* 100 (1910).

¹⁸ *Ibid.*, at 105.

¹⁹ *Ibid.*, at 107.

²⁰ *Ibid.*, at 78.

1877,²¹ and sometime in the same year Professor A. E. Dolbear, of Tufts College, copyrighted a book entitled, *The Telephone: An Account of the Phenomena of Electricity, Magnetism, and Sound, as Involved in Its Action, with Directions for Making a Speaking Telephone*. In this book, Dolbear traced the growth of the telephone from widely known principles of electricity, magnetism, and sound. The phenomenon of electro-magnetic induction—which underlies the successful transmission of sound over wires—Dolbear pointed out, was made known to the world by Oersted and Faraday. In the 1850's, Helmholtz explored the phenomena of sound. And as we have seen, Bourseul put Faraday and Helmholtz together in 1854. Finally, and with a certain measure of inevitability, a German physics teacher, Philip Reis, reduced Bourseul's conception to a primitive type of practice in 1861, at least ten years before Bell had even dreamed of transmitting speech over wires.

The case of Reis illustrates the extreme uncertainty inevitable in any attempt to grant exclusive awards for inventions. One of the defenses to the infringement suits brought by the Bell people was that the Bell patent was invalid because his invention constituted only a mechanical advance over the discoveries of Reis. The following quotations from the majority opinion of the Supreme Court indicate how nicely balanced the questions in patent litigation may become. "That Reis knew what had to be done in order to transmit speech by electricity is very apparent," said Mr. Chief Justice Waite.²² And again: "He could sing through his apparatus, but he could not talk,"²³ At this point it should be remembered that Bell could neither sing nor talk over his device when he applied for a patent on "new and useful Improvements in Telegraphy."²⁴ The reason for preferring Bell to Reis lay deeper, however, than the mere ability or inability to transmit speech. As the Court pointed out, Reis had not perceived that speech could be transmitted only if a constant current were maintained over the circuit.²⁵ His device operated in an intermittent circuit, which rendered impossible the transmission of all the delicate vibrations of speech, whereas Bell's invention consisted in maintaining a constant current and incorporating an armature free at one end to relay the vibrations

²¹ Ibid., at 52.

²² The Telephone Cases, 126 U.S. 1, 540 (1888).

²³ Ibid. Cf. the publications quoted, *ibid.*, at 55-6 et seq.

²⁴ See the opinion of the majority of the court in The Telephone Cases, *ibid.*, at 535. The fact that Bell had not transmitted speech until after his patent was issued is beyond dispute; even Casson admits it. See The History of the Telephone 32-3 (1910).

²⁵ See the opinion of the majority in The Telephone Cases, 126 U.S. 1, 544-45 (1888). Bell was acquainted with what Reis had done in telephony. See *op. cit. supra*, note 10, at 258-63.

from the diaphragm to the wire, in the transmitter, or from the wire to the diaphragm, in the receiver.

In a paper published in 1861, fifteen years before Bell's patent was issued, Reis professed more success in the transmission of speech than Bell had achieved before his patent was issued: "Hitherto it has not been possible to reproduce the tones of human speech with a distinctness sufficient for every one," Reis said. "The consonants are for the most part reproduced pretty distinctly, but the vowels as yet not in an equal degree."²⁶ So close was Reis to Bell's alleged discovery of the necessity of a closed circuit, that upon occasion his device would transmit speech—at least as well as Bell's had on March 10, 1876—when it was inadvertently jammed or mishandled, thus maintaining a constant current.²⁷ And Professor Charles R. Cross, expert witness for the Bell Telephone Company, testified that the Reis instrument could equal the performance of an improved version of the Bell instrument with no other change than the adjustment of a screw.²⁸

There are other facts which challenge the accuracy of the statement that Bell was the sole and lone inventor of the telephone. As the title of Dolbear's book indicates, he had himself produced a telephone (in the summer of 1876), and it was acknowledged by all as superior to Bell's. But Dolbear's invention was held to be merely an improvement on Bell's discovery that a constant current is a prerequisite to the transmission of speech. Hence, it could be used only if licensed by the Bell Company, and since the Bell Company extended no licenses to enterprisers who wished to remain independent, users of the Dolbear instrument were subject to infringement suit. This accounts for some of the 587 suits in which the Bell Company was involved prior to 1910.

Attention here has been restricted to only a few of the men who had been working prior to or contemporaneously with Bell on the problems of telephony. A roll call of some of the men actively engaged in the telephonic field may better convey the extent of the interest in that field. Besides Bell, Reis, Gray, and Dolbear, significant work was done by Edison, Blake, Phelps, Berliner, McDonough, Varley, and Van der Wyde. For a more adequate picture of the activity in the field, reference may be had to volume 126 of the *Supreme Court Reports*, where a large number of publications dealing with research in telephony before Bell's discovery are

²⁶ See the publication reprinted in 126 U.S. at 190-91.

²⁷ See MacMeal, *The Story of Independent Telephony* 7 (1934).

²⁸ See Interrogation 59x and answer, cited in 126 U.S. 1, 201; X-Int. 135 et seq. and answers, *ibid.*, at 202-3.

either cited or reprinted in part. Acquaintance with these materials and with the basic contributions of Faraday, Helmholtz, Bourseul, and Reis makes Casson's statement that Bell invented the telephone "alone" poor poetry at best.

It remains now to review more material which, in addition to that concerning Reis, renders doubtful Casson's other statement, namely, that "there was no telephone until Bell made one." This material should illustrate further the inescapable difficulties inherent in the attempt of the patent system to reward one inventor to the exclusion of all others.

Whether or not Daniel Drawbaugh actually anticipated Bell in the production of a successful telephone, one-sided analysts have distorted the historical record with respect to both Drawbaugh's character and the merits of his contention of priority. "The fact about Drawbaugh," says Casson, "is that he was a mechanic in a country village near Harrisburg, Pennsylvania. He was ingenious but not inventive; and loved to display his mechanical skill before the farmers and villagers. He was a subscriber to *The Scientific American*; and it had become the fixed habit of his life to copy other people's inventions and exhibit them as his own."²⁹ Rhodes distorts the record by quoting, as a self-characterization by Drawbaugh, a biographical sketch which had probably been written by an enthusiastic provincial journalist.³⁰ This is the way Rhodes presents the characterization: "Drawbaugh described himself as 'one of the greatest inventive geniuses of this age, who has spent the greater part of an active life conceiving and producing, as the result of the conceptions of an unusually fertile brain, a score of useful, ingenious machines and devices.'"³¹

With this characterization of Drawbaugh, one may compare that established by the testimony of his neighbors, who described him as sober, truthful, and industrious.³² And against the charge that Drawbaugh was a charlatan, which seems to have figured largely in the judicial opinions deciding against him, may be placed the facts that he lived in one community all his life, counted the governor of the state among his friends, and had no trouble getting hundreds of members of that community to testify to their respect and admiration for him.

But what is more important, practically an entire community testified that they had, at least five years before Bell's invention, either seen, heard

²⁹ Casson, *The History of the Telephone* 98 (1910).

³⁰ Uncontroverted evidence adduced by Drawbaugh's counsel. See 126 U.S. 1, 359 (1888).

³¹ Rhodes, *Beginnings of Telephony* 66 (1929).

³² For the facts on Drawbaugh here adduced, see 126 U.S. 1, 331 et seq., especially at 339, 356 et seq. None of the actual testimony was controverted. See the arguments of opposing counsel and the majority and minority opinions in the Supreme Court.

of, or heard through the telephone which Drawbaugh contended he had reduced to practice as early as 1867.³³ The witnesses were of all classes: poor and ignorant, well to do and sophisticated. And though the Bell people had later planted spies in the community, they were unable to find any evidence of collusion—even though they employed as agents some of the members of the community.³⁴ It is impossible to reproduce here the total effect of the evidence concerning Drawbaugh's claim—for that only a full reading of the record will do. But the main arguments for and against Drawbaugh must be adduced in order to demonstrate the character of the criteria and the type of analysis made necessary by the patent system.

One of the main objections to Drawbaugh, as the inventor of the telephone, was that his comparatively thin formal education and the character of his prior inventive efforts made it inherently incredible, to the Bell lawyers and the deciding judges, that he could have conceived, or, even more, have executed, such a consummate achievement as the speaking telephone. As illustrative of the judicial formulation of these objections, one of the quotations culled by Mr. Rhodes in presenting Drawbaugh's case to the readers of his book may be set out here:

Drawbaugh . . . was not only untutored, but he was isolated by his associations and occupations from contact with men of advanced science; he had narrow opportunities for instruction, and few incentives for profound research . . . ; he was a tyro in electrical science, essaying the most difficult work of the electrician. It is almost incredible that the subtle intellectual discoveries which were a closed book to the ablest electrician could have been reached by a smatterer in science.³⁵

The encomia given Bell reveal by way of paradox the inadequacy of this approach. What Bell had done, says Casson, "was so amazing, so foolhardy, that no trained electrician could have thought of it. It was 'the very hardihood of invention.' . . ."³⁶ Elsewhere Casson speaks of Bell as having "picked up a smattering of anatomy, music, electricity, and telegraphy."³⁷ As late as 1875, when Bell is said to have completed all but minor details of his invention, he is reported to have complained, when urged to develop his ideas: "But I have not got the electrical knowledge that is nec-

³³ Between three and four hundred witnesses testified for Drawbaugh. See the majority opinion, *ibid.*, at 555.

³⁴ See the uncontroverted evidence adduced in argument. *Ibid.*, at 337-40.

³⁵ Wallace, J., in *American Bell Telephone Co. v. People's Telephone Co.*, 22 Fed. 309, 329 (D.C., N.Y., 1884). Quoted in Rhodes, *Beginnings of Telephony* 66(1929). The deletions in this quotation are Rhodes's.

³⁶ *The History of the Telephone* 34-5 (1910).

³⁷ *Ibid.*, at 16.

essary.”³⁸ And again, after he had achieved success: “Had I known more about electricity, and less about sound, I would never have invented the telephone.”³⁹ The opinion of a contemporary physicist is that Bell “did not realize what tiny amounts of energy he was planning to control. If he had, he might have been too discouraged to begin.”⁴⁰

Also relevant here is the observation of Drawbaugh’s counsel, who said: “We believe it can be shown that successful inventors are not the product of universities.”⁴¹ Among the examples in support of his contention, counsel cited Michael Faraday, whose formal education began and ended with a few lectures by Sir Humphrey Davy. Faraday’s subsequent experimental researches, according to an English physicist, gave a great deal of trouble to his more educated contemporaries who “were unable to avoid mistakes in stating, in what they conceived the more scientific language than Faraday’s, the phenomena before them.”⁴²

To reach the all or none conclusion required by the patent system, the courts were forced to disregard or minimize the importance of several facts which indicate that Drawbaugh’s vision may well have been equal to Bell’s. He had access to and read books recounting fundamental discoveries in physics and chemistry, and others showing the applications of research to useful arts. He was an ingenious fellow. He displayed the poetic frenzy of profound concentration and application, was selflessly generous (and nagged by his wife)—characteristics (except the last) rhythmically displayed in descriptions of Alexander Graham Bell. And prior to 1860 he had, like Faraday, attended a course of lectures by a college professor of physics, who testified that at that early time Drawbaugh had shown keen interest in electrical science and had talked of “speaking through a telegraph wire by electricity.”⁴³

This first ground for rejecting Drawbaugh seems an example of juridical “psychology” at its worst. To rest the claim to an invention in any degree on such a criterion as the “educated vision” of the claimant would be dangerous even if consistently employed. For “imagination,” “vision,” “conception” are ideas which give even literary philosophers many a painful moment. And yet, if patents are to be issued, and the consequences of their possession are to remain what they have been, conflicts of great mag-

³⁸ *Ibid.*, at 30.

⁴⁰ Harrison, *Atoms in Action* 47 (1939).

³⁹ *Ibid.*, at 39.

⁴¹ *The Telephone Cases*, 126 U.S. 1, 350 (1888).

⁴² J. Clark Maxwell, Professor of Physics at Cambridge, in *Maxwell on Electricity*. Cited in 126 U.S. 1, 352. One is reminded of Ben Jonson’s patronizing reference to William Shakespeare, who had small Latin and less Greek.

⁴³ 126 U.S. 1, 356-57.

nitude are certain to arise and criteria such as the foregoing must figure in the disposition of the cases. Indeed, according to the explicit statement of the Supreme Court, Drawbaugh's failure to measure up to such a criterion was predominantly responsible for its decision against him. Despite the persuasiveness of Drawbaugh's many witnesses, the Court said his failure publicly to contest Bell's claim for nearly four years after the world had known of it was conclusively against his prior inventorship:

We have not overlooked the depositions that have been taken in such large numbers to show that Drawbaugh was successful. . . . They have been studied with care, and if they contained all the testimony in the case it would be more difficult to reach the conclusion that Drawbaugh's claim was not sustained. But in our opinion their effect has been completely overcome by the conduct of Drawbaugh, about which there is no dispute, from the time of his visit to the Centennial [where Bell's telephone was on exhibition] until he was put forward by the promoters of the People's Company, nearly four years afterwards, to contest the claims of Bell.⁴⁴

Such conduct the Court found contrary to human nature: "No man of his intelligence, with or without the enthusiasm upon the subject which it is said he possessed, could have remained silent under such circumstances."⁴⁵ Yet there was uncontroverted evidence that Drawbaugh had approached different men for aid in publicizing his invention in 1878. There was a veritable mountain of evidence that people had seen, heard, and talked through Drawbaugh's device on and off from as early as 1869. He had been ridiculed, and, later, advised that he could not antedate Bell.⁴⁶

More of Bell's experience is relevant here. His enthusiastic supporters have deplored the lethargy displayed with respect to his telephone. It lay on exhibition at the Philadelphia Centennial Exposition "for more than six weeks, without attracting the serious attention of anybody."⁴⁷ Indeed, except for the occurrence of a "marvelous" accident, it might have gone unnoticed by the commissioners, who had, according to Casson, given it only blank stares until Bell's friend, the Emperor of Brazil, burst in on the tableau and enthusiastically drew their attention to it.⁴⁸ "This incident in itself," says Rhodes, "served to direct the attention to Professor Bell and his exhibit."⁴⁹ While this may be more poetry, there is the further fact that one must "look in vain," as A.T.&T. vice-president John J. Carty

⁴⁴ Majority opinion, *ibid.*, at 565.

⁴⁵ *Ibid.*, at 562.

⁴⁶ *Ibid.* See also, *ibid.*, at 347 et seq.

⁴⁷ Casson, *The History of the Telephone* 37 (1910).

⁴⁸ *Ibid.*, at 37-8.

⁴⁹ Rhodes, *Beginnings of Telephony* 31 (1929).

put it, for mention of the Bell Telephone in the two-volume report of the Centennial.⁵⁰ For a year after the Centennial, moreover, the only public notice Bell got was derisive. "Poor Bell, instead of being applauded was pelted with a hailstorm of ridicule. He was an 'impostor,' a 'ventriloquist,' a 'crank who says he can talk through a wire.'"⁵¹ Businessmen called Bell's telephone a scientific toy. The *London Times* termed it the "latest American humbug."⁵² There is the final fact that not a single telephone was sold for more than a full year after Bell received his patent; Bell had trouble giving them away.⁵³ Is it not possible that a similar reception by those introduced to Drawbaugh's device, together with a thousand other possible incidents, could have suppressed its publication? Drawbaugh was not in the beginning subject, as Bell was, to the pressures of businessmen who had financed his experiments with the understanding that they should share in the results. And when businessmen did get hold of Drawbaugh, they gave him plenty of publicity.

Whether or not Drawbaugh anticipated Bell is not important here. The important point is that determining priority of invention, as the patent system requires, makes necessary a type of procedure which cannot but approach arbitrariness. That human beings have a nature, and that it is in a general way knowable, cannot be denied. But that the detailed possibilities of human conduct can be predicted or assessed on the basis of this unknown though knowable human nature, seems at present absurd. The courts essay a bootless job, so far as tenable objectives such as equitable allocation of rewards for invention are concerned, in attempting to define either an "invention" or an "inventor." While one may concur in the decision of a given case, the criteria necessarily employed provoke an arbitrariness of analysis which sweeps through all the cases like a strong midchannel current, and concurrence in the decision of the one case is, therefore, swept forward to the conclusion that a right decision in the average case is more or less an accident.

The extent to which the award of letters patent may approach the arbitrary is most forcefully illustrated by the attitude displayed toward Drawbaugh's witnesses. At bottom, the decision between Bell and Drawbaugh must have rested upon whether or not the latter's witnesses were believed. Over two hundred people testified that they had seen, heard, or talked through his instruments. And this is the way District Judge Wallace, quoted at great length by Rhodes, disposed of them:

⁵⁰ Quoted, *ibid.*, at 33.

⁵¹ Casson, *The History of the Telephone* 42-3 (1910).

⁵² *Ibid.*, and see at 50-51.

⁵³ *Ibid.*, at 52-3.

[The witnesses] have confused the fragmentary and incoherent articulation of such an apparatus, with the hearing of distinct words and sentences. . . .

Succinctly stated most favorably for [Drawbaugh and his backers] the case is this: One hundred witnesses, more or less, testify that on one or more occasions, which took place from five to ten years before, they think they saw this or that device used as a talking machine. They are ignorant of the principles and of the mechanical construction of the instruments, but they heard speech through them perfectly well, and through one set of instruments as well as the other.⁵⁴

The majority of the Supreme Court adopted an even more startling attitude toward the witnesses. In effect it ignored them. It said, as we have seen, that "their effect has been completely overcome" by Drawbaugh's unnatural conduct.⁵⁵

Though Rhodes quoted from both the district court and the majority opinion in the Supreme Court, he ignored the dissenting opinion of Justices Field, Bradley, and Harlan. The following quotations may explain the omission:

We think that Drawbaugh anticipated the invention of Mr. Bell, who, at most, is not claimed to have invented the speaking telephone prior to June 10th, 1875. We think that the evidence on this point is so overwhelming, with regard both to the number and character of the witnesses, that it cannot be overcome. . . .

We are satisfied from a very great preponderance of evidence, that Drawbaugh produced, and exhibited in his shop, as early as 1869, an electrical instrument by which he transmitted speech, so as to be distinctly heard and understood, by means of a wire and the employment of variable resistance to the electrical current. . . .

On the question of time and result, there is such a cloud of witnesses . . . that it seems impossible not to give credence to them. The evidence of some of them may have been shaken with regard to the time they had in mind; but that of the great majority was not shaken at all, but corroborated by circumstances which rendered the proof irrefragable. Many of them, it is true, were plain country people; but they heard the words through the instrument; and that is a matter about which they could not be mistaken. It did not require science nor learning to understand that. But the witnesses were not confined to this class. A number of them were people of position in society, official, professional, and literary,—all, however, like the inventor, regarding the matter more as one of curiosity than of public importance. . . .

It is perfectly natural for the world to take the part of the man who has already achieved eminence. . . . It is regarded as incredible that so great a discovery should have been made by the plain mechanic, and not by the eminent scientist and inventor. Yet the proof amounts to demonstration, from the testimony of Mr. Bell himself, and his assistant, Watson, that he never transmitted an intelligible word through an electrical instrument, nor produced any such instrument that would transmit an intelli-

⁵⁴ American Bell Telephone Co. v. People's Telephone Co., 22 Fed. 309, 336, 339 (D.C., N.Y. 1884).

⁵⁵ Supra note 44.

gible word, until after his patent had been issued; whilst, for years before, Drawbaugh had talked through his, so that words and sentences had again and again been distinctly heard.⁵⁶

Thus, of seven Supreme Court Justices, four chose Bell and three refused to brand hundreds of apparently honest witnesses knaves or fools. For those who are still satisfied with the operation of the patent system, one may raise this question: *Would they feel the same way if one more of the Justices had been persuaded by the unshaken testimony of Drawbaugh's witnesses?*

Reis could sing through his telephone, and according to a "cloud of witnesses" Drawbaugh could talk through his; but Bell, who could neither sing nor talk through his telephone, was preferred. To the exclusion of all others working in the field, prestige and monopoly rights were given to Bell. This result, stoutly affirmed as the essence of justice by some persons, is viewed less dogmatically by disinterested persons. "Bell has been called the Columbus of the telephone advisedly," a recent writer has said, "for regardless of whether or not others crossed the Atlantic before him, Columbus gave the world a new continent."⁵⁷ Alluding to the exclusionary character of the patent system in the context of the telephone controversy, this writer continues:

Such questions of priority frequently arise in scientific fields, as in other fields of human endeavor; and whenever one individual is mentioned as being responsible for some accomplishment, it is well to remember that usually there are others whose claims are almost as great and sometimes greater, yet who, by some twist of fate, have been deprived of the heroic position which one man can hold, though a battalion cannot.⁵⁸

In an address entitled "The Inventors of the Telegraph and Telephone," delivered in 1891, Professor Thomas Gray, F.R.S.E., regretted that his account of the creation of the telephone and telegraph of necessity ignored "a host of important contributors." "To go into detail and do justice to everyone who has contributed," he said, "was an impossibility."⁵⁹ The patent system, more rigorous than even the Almighty, chooses only one. To cast a final doubt at its choice, Elisha Gray, who never relinquished his claim of having anticipated Bell in inventing the telephone, left this statement among the papers found after his death:

⁵⁶ The quotations are from the dissenting opinion. *The Telephone Cases*, 126 U.S. 1, 573-76 (1888).

⁵⁷ Harrison, *Atoms in Action* 46 (1939).

⁵⁸ *Ibid.*

⁵⁹ *Annual Report of the Smithsonian Institution* 639, 657 (1892). See also Bawden, *Man's Physical Universe* 509 et seq. (1943).

The history of the telephone will never be fully written. It is partly hidden away in twenty or thirty thousand words of testimony and partly lying on the hearts and consciences of a few whose lips are sealed—some in death and others by a golden clasp whose grip is even tighter.⁶⁰

The last ten words of Gray's statement take this analysis back to a more factual base. The individuals we have been preoccupied with were actually like so many puppets in the litigation; as in a puppet show, the real business was going on backstage. The most important issue to be decided by the litigation was not which of the alleged inventors was to be granted priority, but whether one of the parties litigant was to be allowed to exclude all others in the production and distribution of telephones. The parties were corporations; the inventors were financially interested in the results of the litigation to only an extremely attenuated degree, if at all. By 1887, Bell's financial interest in the corporation which bore his name was probably minuscule; he had no interest in its policies.⁶¹ As Casson points out, Bell "had done his part, and it now remained for men of different abilities to take up his telephone and adapt it to the uses and conditions of the business world."⁶²

Men of different abilities also took charge of the contributions of Edison, Gray, and Dolbear. And the "adaptation" is not exactly what Casson meant to suggest. Western Union bought in the inventions of Edison, Gray, and Dolbear to wipe out the Bell Telephone Company. For the telephone was a threat to established telegraph interests, i.e., to Western Union, a near-monopoly built on patents with a history similar to that of the telephone patents. But then it came to pass that Western Union was faced with a more savage competitor in telegraphy; that Bell Telephone was willing to resist domination; and that Bell Telephone was willing to agree not to compete with Western Union in telegraphy. So an agreement between Bell Telephone and Western Union was formed. Some have argued that Western Union dropped its attack on the Bell Company simply because the latter's patents were unassailable.⁶³ This does not fit well with the promise by the Bell Company to pay Western Union 20 per cent

⁶⁰ Quoted in MacMeal, *The Story of Independent Telephony* 11 (1934).

⁶¹ In the grand tradition of inventors, Bell seems to have been unmoved by the possibility of great personal wealth. He owned only ten shares of the 5000 issued in the first Bell Telephone Company. See Danielian, *A.T.&T.: The Story of Industrial Conquest* 9, note* (1939). When that company was reorganized, in 1879, and became the National Bell Telephone Company, Bell was not one of its executives; he was carried as "electrician." *Ibid.*, at 11, note*.

⁶² *The History of the Telephone* 46 (1910).

⁶³ *Ibid.*, at 80-4. Rhodes, *Beginnings of Telephony* 52-3 (1929).

of the receipts from all telephone licenses, which Rhodes mentions;⁶⁴ nor does it fit well with the Bell Company's promise to keep out of the telegraph business,⁶⁵ which Rhodes does not mention. Danielian, the author of a fact-based analysis of A.T.&T., saw the settlement between the Bell Company and Western Union as a subplot of the play in which Western Union and American Union Telegraph Company were principals, struggling for a monopoly in electrical communications. When Western Union was certain that American Union could be kept from control of the telephone, and when it was certain, moreover, that the Bell Company would agree to keep out of the telegraph business, it gave up its claims in telephony in order to concentrate on its main struggle—the battle with American Union.⁶⁶ This throws some doubt on the pat explanation that Western Union was forced to give up its attack simply because of the unquestionable priority and validity of the Bell patents.

The extent to which inventors and inventions may be used merely as tactical means in the strategy of monopoly is further illustrated by another charge in the Government suit for annulment of the Bell patents. Among other things, the Government alleged that Dolbear anticipated one of the Bell inventions and assigned the alleged anticipation to Western Union.⁶⁷ When Western Union and the Bell Company settled their differences, the Government contended, “[Western Union] suppressed the fact as to the said invention of said Dolbear.”⁶⁸ Moreover, “in order further to suppress the facts, [these companies] caused a collusive interference case to be begun in the United States Patent Office between said Bell and said Dolbear, wherein said Dolbear was not represented except in name, and wherein his assigns, the said Western Union Telegraph Company, the American Bell Telephone Company and said Bell were the real parties and were all in one interest.”⁶⁹ Dolbear's attorney in this interference, the Government went on to charge, was “in fact one of the counsel for and in the pay of said American Bell Telephone Company.”⁷⁰

Though these charges were never adjudicated, it is scarcely possible that they were completely without foundation. Whether or not these charges were well founded, moreover, is much less important than the

⁶⁴ Rhodes summarizes the agreement between Bell Telephone Company and Western Union on pp. 52–3.

⁶⁵ Danielian, *op. cit. supra*, note 61, at 42.

⁶⁶ *Ibid.*, at 41 et seq.

⁶⁷ *U.S. v. Bell Telephone Co.*, 128 U.S. 315, 322 (1888).

⁶⁸ *Ibid.*, at 323.

⁶⁹ *Ibid.*

⁷⁰ *Ibid.*, at 323–24.

fact that, the alleged conduct, if it had occurred, would have been a not uncommon result of the conditions created by the patent system.⁷¹ More important at this point is the fact that inventors and inventions, presumably the primary concern of the patent system, are actually inconsequential in terms of the net effect of the system. So far as the patent system is concerned, technology is, largely, merely a field on which other forces play.

The point of the foregoing materials is that the patent system does not and cannot achieve even its immediate purpose. Attempting to give exclusive rewards to one inventor for one invention, it cannot possibly succeed in a just manner, except accidentally, because for all practical purposes there is no such thing as one inventor or one invention. And as the truth of this statement becomes more evident and the subject matter more important, the inadequacy and overwhelming social cost of the patent system grow more apparent.⁷² At this point the system assumes the identity which is, from a social point of view, its most significant one. The most attractive thing the patent system has to offer is monopoly. Inventors and invention, the progress of science and useful arts, become incidental concerns, the promotion of which is lost in the pursuit of other objects—the assumption and maintenance of monopoly power.

Daniel Drawbaugh, simply as an inventor of the telephone, would probably never have been heard of by the public. But as a means of wresting from the Bell Company its monopoly position, he received plenty of publicity. To promote Drawbaugh simply as another inventor with important skills to contribute, the patent system was useless, for there can be only one inventor interested in a given invention—if *the patent system works perfectly*. But as a countercheck to the Bell interests, Daniel Drawbaugh was extremely valuable under the patent system—because the system cannot be depended upon to work perfectly and there is always the chance, therefore, that it will work badly in the given case. The people who got hold of Drawbaugh advertised that their possession of his invention would “certainly result in the driving out of all telephones

⁷¹ Practices similar to those charged against Western Union and the Bell Company were proved in the glass container industry. See Part I of this article, 12 Univ. Chi. L. Rev. 80 (1944), especially at note 23.

⁷² With a broader base of scientific knowledge and with more people trained in technology, simultaneous invention will occur more often than ever. On this trend, see Bichowsky, *Industrial Research* (1942). A physicist, chemist, inventor, and organizer and director of industrial research laboratories, Mr. Bichowsky says: “The real danger of loss of an invention to someone else . . . is . . . due to the fact that in an astonishingly large proportion of cases the same idea is conceived in different laboratories at the same time. Many important patents have to fight ten or even fifty interferences among inventors of the same idea, who have filed patents [applications] usually within a year of the earliest or senior party” (p. 48).

in the market, save the ones they hold.”⁷³ The comment of a New York journal on the projected activities of this company was that “a long and interesting legal fight is anticipated.”⁷⁴ And, of course, a long, interesting, and expensive legal fight did ensue.

The result of this fight reflects the result of all patent conflicts—suppression of competition, through either creation of restraints of trade by industrial combination, or, for especially fortunate combatants, the patent system’s medal of honor: outright monopoly. Having slashed away all inventors but one, the patent system goes on to insure that only one—or, in effect only one—producer remains in the field.

II

Any one of several of the most important industries in the United States may be chosen to reveal a development significantly similar to that of A.T.&T.; it has been common for widespread inventive activity to be channelized by the patent system into long-run monopoly of production. In a book published twenty years ago, Mr. Floyd L. Vaughan analyzed the origin and character of several of our monopolies or near-monopolies.⁷⁵ He found that patent aggregations were a substantial element in their formation and the critical element in their maintenance. In steel and wire, shoe machinery, containers, mimeograph equipment, photographic supplies, oil production and processing, farm machinery, and incandescent lamps, Mr. Vaughan demonstrated monopolistic organization built upon patent protection.⁷⁶ Concluding this part of his study, he said:

This chapter reveals the extent to which patents have assisted in the formation and continuation of some of the most objectionable monopolies. The author takes the position that competition in the industrial field promotes economic progress and protects the people against extortion. It is not the purpose of this study to discuss the evils of monopoly—high prices, the delimitation of economic opportunity, etc. They represent an economic cost, and a tremendous one, and therefore a liability in estimating the net worth of the patent system.⁷⁷

To say that patents have *assisted* in the growth of monopolies is a true statement, but it does not go far enough. The patent system has not only assisted in the growth of monopolies. It has made them in many cases a practical necessity.

In the shoe machinery industry, for example, primary responsibility for

⁷³ See the newspaper account reprinted in *The Telephone Cases*, 126 U.S. 1, 549 (1888).

⁷⁴ *Ibid.*, at 550.

⁷⁵ Vaughan, *Economics of Our Patent System* (1925).

⁷⁶ *Ibid.*, at 74 et seq.

⁷⁷ *Ibid.*, at 101.

monopoly goes to the patent system. Owing to the widespread character of inventive activity and the impossibility of clearly defining an invention for patent purposes, patent rights in the same or closely related aspects of shoe machinery were held by different parties. None of the patentees, consequently, could go into production without risking infringement suits by others. One of the witnesses for the United Shoe Machinery Company, in a suit brought against it, testified:

We should hardly have dared to go ahead . . . for fear of not succeeding in our patent litigation, or of conflicting with such improvements as Plant had patented. On the other hand, Plant . . . would have hardly dared to go ahead with the possibility of these infringement suits. These infringement suits, or a good many of them, were then pending, and certainly he would have found very few customers, I think, for his machines.⁷⁸

To get into production, the company chose to buy up all outstanding patents, or at least enough to insure impregnability and domination. When a suit was brought by the Government against the shoe machinery monopoly, the Supreme Court held in favor of the defendant. The monopoly was regarded as a natural and desirable means of avoiding a patent deadlock—"a situation familiar in patent law and contests," according to Mr. Justice McKenna.⁷⁹ "It will be seen, therefore," he continued, "that there was no other way out of the deadlock, if the inventions were to be used together, . . . than by ownership in one hand of all the patents."⁸⁰

We know that there are other ways out of a patent deadlock, but as of Mr. Justice McKenna's time ownership in one hand of all patents, regardless of their origin, was most impressive. The Aluminum Company of America is another monopoly product of the patent system. Remarkably similar to A.T.&T.'s, Alcoa's pedigree reveals simultaneous and intersecting inventions based again on the common cultural heritage of scientific research. Here the inventions rested on the basic researches of Sir Humphrey Davy, who is generally accredited with discovery of electrolysis as a method of reducing compounds. Until the 1880's, however, the process had not been successfully adapted to the reduction of pure alumina. Then, in 1886, two men independently achieved success and applied almost simultaneously for patents. The two men were Charles M. Hall of the United States and Paul L. T. Héroult of France. Since the patent system can countenance only one of several independent inventors, either Hall or Héroult had to lose—to ponder the proposition that the patent system rewards inventors. The Frenchman lost. With the patent awarded

⁷⁸ *United States v. United Shoe Machinery Co.*, 247 U.S. 32, 51 (1918).

⁷⁹ *Ibid.*

⁸⁰ *Ibid.*

to Hall, the Pittsburgh Reduction Company achieved a monopoly in the production of pure alumina.⁸¹

Again, however, a theretofore unheard of inventor was produced (this time successfully) to challenge the established monopoly. One Charles S. Bradley had applied in 1883 for a patent on an electrolytic process for reducing nonconducting metals in general, and alumina in particular, without the use of external heat. For nine years his application lay dormant in the Patent Office, when, for some little-known reason, it was activated and a patent issued. By that time, of course, Bradley had only a vicarious interest in the invention; he had assigned all his rights in metal-reduction processes to others. Litigation between alleged assignees determined that those rights had come to rest in the Cowles brothers. They promptly sued the Pittsburgh Company, and about ten years later, after a contrary decision in the district court,⁸² a circuit court of appeals held the Bradley patent valid, prior to, and infringed by the Hall patent.⁸³ Some authorities, again confounding the confusion created by the patent system, have contended that the Bradley patent should never have been issued. Their charge is that Bradley had never reduced his process to practice, that, like Bell, he had simply entered a broad claim for every possible use of an unworked theory.⁸⁴ The fact remains, however, that under the decision of the circuit court of appeals the holders of the Bradley patent could keep anyone else from using electrolysis as a means of reducing nonconducting metals.

But this holding did not settle things. Though the Cowleses received a \$3,000,000 judgment against the Pittsburgh Company, neither could produce pure alumina by the most efficient process then known, without permission from the other. This mutual frustration was a consequence of Hall's having patented improvements on what came to be called the Bradley process. Thus, the Cowleses could produce pure alumina, but they could not do it most efficiently without a license from the Pittsburgh Company; the latter could not produce at all without permission from the Cowleses. The settlement is a matter of history. As Mr. Wallace, author of a comprehensive study of the aluminum industry, succinctly stated, "The competition in invention issued in monopoly of production."⁸⁵ Mr.

⁸¹ See generally, Wallace, *Market Control in the Aluminum Industry* 4-6, and Appendix B (1937).

⁸² *Electric Smelting & Aluminum Co. v. Pittsburgh Reduction Co.*, 111 Fed. 742 (D.C., N.Y., 1901).

⁸³ *Electric Smelting & Aluminum Co. v. Pittsburgh Reduction Co.*, 125 Fed. 926 (C.C.A. 2d, 1903).

⁸⁴ See Wallace, *op. cit. supra*, note 81, at 536, n. 28.

⁸⁵ *Ibid.*, at 6.

Wallace has also given an admirable summary of the final disposition of the various rights: "Hall and his associates . . . remained alone in the field. The Cowleses . . . received a cash award. And Bradley . . . received *recognition*."⁸⁶

The Bradley patent, applied for in 1883, issued in 1892, and extending protection against all competition until 1909, gave the Pittsburgh Company a complete monopoly for at least three years longer than the Hall patents (issued 1886-89) would have given. Thus the patent system carried Pittsburgh Reduction, as Wallace points out, "past the business boom of 1906-1907 into the middle of the succeeding depression, and really gave [it] three extra years in which to become so well fortified against competition that none developed."⁸⁷ The telephone monopoly enjoyed comparable benefit from the "seventeen-year" exclusive right granted by the patent system.⁸⁸

Time and the patent system have painted the face of monopoly in infinite variety. Most steadfast are the hues heretofore seen. In these cases, invention, vested interest, or stubbornness were not widespread enough to make ownership of all patents by one party impossible. To get into production with the security of a monopoly position, the various parties in interest found it possible or desirable to unite ownership in one company. But in some cases inventive activity is even more far flung than it was in the telephone, shoe machinery, or aluminum industries. In some cases the vested interest in invention is more deeply rooted, moreover, and interested parties are reluctant to part with a good thing. In such cases different forms are necessary, though the same effect can be achieved. To get into production with the benefits of monopoly, when various patent holders seek to remain in business or it is inconvenient to merge or consolidate, the parties may avail themselves of other devices which the patent system holds out as means of avoiding the frustrating difficulties it has created. Conflicting patentees may pool or cross-license their patents, retaining the essential characteristics of monopoly. So long as the pool is a consequence of "legitimate conflicts" created by the Patent Office, its

⁸⁶ *Ibid.*, at 536-37. Italics added.

⁸⁷ *Ibid.*

⁸⁸ The Berliner transmitter patent, an indispensable element in the Bell Telephone monopoly, was applied for in 1877 but not issued until 1891, thus extending patent protection for over thirty years. The transmitter covered by the Berliner patent had been used by the Bell Company since 1878. See *United States v. Bell Telephone Co.*, 167 U.S. 224 (1897). For other examples of prolonged patent protection, see Hamilton, *Patents and Free Enterprise* 135 et seq., T.N.E.C. Monograph No. 31 (1941).

members may coordinate their price policies and restrict entrance into the field. The pool is illegal under the Sherman Act—so far as established doctrine reveals—only if it was created with the primary purpose of dominating an industry, and if, moreover, that purpose is realized.⁸⁹

The leading case on patent pools is usually said to be *Standard Oil Co. (Indiana) et al. v. United States*.⁹⁰ The common phenomena of widespread inventive activity and conflicting patent rights existed in the oil industry. An infringement suit had already been begun and several interferences had been declared. Allegedly to escape the confusion and insecurity created by the patent system, four large companies entered agreements. "Their sole object," they had asserted, "was to avoid litigation and losses incident to conflicting patents."⁹¹ Under the agreements the cross-licensing firms pooled royalties received from licenses issued by them. To the charge of the Government that such pooling of royalties evinced an intention to obtain a monopoly and was therefore illegal under the Sherman Act, the Court replied:

This contention is unsound. Such provisions for the division of royalties are not in themselves conclusive evidence of illegality. Where there are legitimately conflicting claims or threatened interferences, a settlement by agreement, rather than litigation, is not precluded by the [Sherman] Act. . . . An interchange of patent rights and a division of royalties according to the value attributed by the parties to their respective patent claims is frequently necessary *if technical advancement is not to be blocked by threatened litigation*.⁹²

Thus the patent system, created to stimulate the arts and sciences in a day when we were even more bereft of them than we are now, actually makes concentration of industrial power a practical necessity. To produce at all, these oil companies contended, they had to get together. Getting together meant control of between 60 and 90 per cent of the production of

⁸⁹ No alteration of the generalization given in the text above is required by the recently decided *Hartford-Empire* case,—U.S.—(1945) 65 S. Ct. 373 (1945), which held that the purpose of the arrangement there condemned was domination of the glass container industry. The inadequacy and confusion of this approach is pointed up by the fact that the original agreement, between Hartford-Fairmont and Corning-Empire, was provoked by apparently legitimate conflict in the Patent Office. See Part I of this article, 12 Univ. Chi. L. Rev. 80, 82 (1944). The Supreme Court does not propose, in the *Hartford* case, any alteration of the traditional rights of the patentee; indeed, Mr. Justice Roberts was careful to reaffirm those rights. See *Hartford-Empire Co. v. United States*, 65 S. Ct. 373, 395 (1945). For these reasons it is safe to say that patent-law doctrine, including its uncertainty, is what it was prior to the *Hartford* case. The only difference now is that patentees who are held, for some reason or other, to have abused their patents, may expect to be compelled to license those patents at a reasonable royalty.

⁹⁰ 283 U.S. 163 (1931).

⁹¹ *Ibid.*, at 168.

⁹² *Ibid.*, at 171. Italics added.

cracked gasoline.⁹³ But because their agreement was regarded as a necessary consequence of the frustrating conflicts created by the patent system, and because they were not proved to possess a complete monopoly of cracked gasoline production, the Supreme Court held their combination not illegal under the Sherman Act.

Case after case reveals how the patent system has departed from its express purpose, to serve, instead, the aims of monopoly. The liaison between Westinghouse and General Electric represents an interesting mutation—something between a patent pool and an outright monopoly. General Electric absorbed all its competitors except Westinghouse early in this century. Manufacturing an enormous preponderance of the incandescent bulbs used in the United States, these companies share their patents; prices are fixed in their licensing agreements. These agreements are legal under a famous holding of the Supreme Court, which establishes as one of the immutable prerogatives of the patentee that of fixing prices at which his licensee is to sell the patented product.⁹⁴ Since they either produce themselves or license the production of almost all the incandescent bulbs used in the United States, General Electric and Westinghouse are for all practical purposes a monopoly—another monopoly produced and protected by the patent system.⁹⁵

The cases presented to this point sufficiently indicate how the inherent character of the patent system and its judicially created doctrines assist and even make necessary monopolistic organization of industry. Needless to say, few business organizations need extra incentive to seek the security of monopoly. Nevertheless, the patent system offers incentives even beyond those hitherto mentioned. Besides encouraging monopoly in the manner we have already seen, the patent system goads its concentrations of industrial power to further expansion by exposing them to what appears to be a most vicious danger.

Suppose a completely desirable substitute for the telephone were found by a person independent of A. T. & T.; suppose further that that person could get impregnable patent protection for his new art; and suppose finally that that person refused to do business with A. T. & T., and refused to

⁹³ The parties to the agreement controlled 55 per cent of total cracking capacity. See *ibid.*, at 175. Three of them, however, according to their own statistics, actually produced at least 66 per cent of the total cracked gasoline produced in 1924. See *ibid.*, at 178, note 17. The Government contended that the primary defendants and their licensees produced 94 per cent of the total in 1924. *Ibid.*, at 179, note 17.

⁹⁴ See *United States v. General Electric Co.*, 272 U.S. 476 (1926).

⁹⁵ For more information on the General Electric Co. see Kottke, *Electrical Technology and the Public Interest* 82-3 *passim* (1944); Wood, *Patents and Antitrust Law* 168-72 (1942); Hamilton, *Patents and Free Enterprise*, T.N.E.C. Monograph No. 31 (1941).

license it in exploiting the new art—perfectly legitimate conduct under the patent system. Though A.T.&T. might be economically adaptable to efficient production of the new device, ruthless exploitation by the new patentee could push A.T.& T. out of business. The consequences would be staggering. The largest corporation the world has ever seen would be bankrupt. Hundreds of thousands of employees would be thrown out of work. Six hundred thousand stockholders would emerge with (a) what A.T.& T. brought in scrap auctions and (b) a strong resentment against their erstwhile management.

There can be little doubt that most corporate executives have been haunted by such possibilities. There can be no doubt that the conscientious managers of A.T.& T. have had some bad dreams. The reasonable thing to do, when faced with such dangers, is to make sure that no possibly competitive art is permitted to develop absolutely independently. This the managers of patent monopolies have done.

When radio appeared as a threat to the telephone monopoly, A.T.& T. made sure that it would have a telling part in the future of the new art by purchasing the extremely important rights in the DeForrest vacuum tube, an invention indispensable to the successful exploitation of radio.⁹⁶ Purchase of competing patents is one well-established means of maintaining the monopoly position. Another means to the same end is the creation of an industrial research laboratory. Dr. William D. Coolidge, director of General Electric's research laboratory, has described the general function of industrial research. "I think of research as insurance for industry," he said. When asked, "Insurance against what risk?" Dr. Coolidge replied: "Any industry is manufacturing certain things. Improvements may be made by others which would render those things unsalable." Pressed further with the suggestion, "In other words, insurance against a displacement from its position?" Dr. Coolidge responded: "Yes, that is what I mean."⁹⁷

More detailed statement of a prevailing motive for research is to be seen in a memorandum written to a fellow A.T.& T. executive by Dr. Frank B. Jewett, president of the Bell Telephone Laboratories:

While it is obvious that the basic inventions which control a large new field are not made very often, one can never tell where or when they will crop up. The tremendous

⁹⁶ See Danielian, *op. cit.* supra, note 61, at 102 et seq.

⁹⁷ This interrogation occurred at the T.N.E.C. hearings. See 3 Hearings before the T.N.E.C. 923 (1939). Industrial research, it should not be necessary to add, is, of course, not necessarily limited to defensive and inhibitory action. In the absence of a patent system, its whole thrust would be constructive and progressive. But in the presence of the patent system, the constructive aspects must contend, as we shall see, with desiderata totally irrelevant to technological improvement.

growth in both fundamental and industrial research in recent years has unquestionably increased the probability of such inventions, with their covering patents, arising. When such patents do turn up, possession of a strong and unmortgaged patent position on the part of an industry needing rights is frequently the most powerful and sometimes the only available weapon for securing those rights. Ability to stop the owner of a fundamental and controlling patent from realizing the full fruits of his patent by the ownership of necessary secondary patents may easily put one in position to trade where money alone might be of little value.⁹⁸

The research aims of Hartford-Empire may be gathered from its "Memorandum on Policy," which reads in part:

In taking out patents we have three main purposes—

(a) To cover the actual machines which we are putting out, and prevent duplication of them. . . .

(b) To block the development of machines which might be constructed by others for the same purpose as our machines, using alternative means. . . .

(c) To secure patents on possible improvements of competing machines, so as to "fence in" those and prevent their reaching an improved stage. . . .⁹⁹

Commending the alert management of Alcoa, Federal District Judge Caffey pointed out that it had done many intelligent things. "Among the best of these," he said, "is the establishment of a research organization, equipment, facilities and staff. On the laboratories alone it has spent \$2,300,000."¹⁰⁰

As defensive measures, mass purchase and production of patents have served the monopolies in excellent fashion. Its venture into radio produced a situation highly satisfactory to A.T. & T. "As I look back on it," Dr. Jewett reminisced, "it seems to me that this enlarged and enhanced position [in radio research] played no small part in enabling us to reach our present satisfactory understanding with the General Electric Company and the Radio Corporation of America, and that if we never derive any other benefit from our work than that which follows the safeguarding of our wire interests we can look upon the time and money as having been returned to us many times over."¹⁰¹

⁹⁸ Memorandum for Mr. C. P. Cooper, A.T. & T. vice-president, June 30, 1932. Printed as Ex. 143 in Part 6, Hearings on S. 702 at 935, 938 (1944), 78th Cong., 1st Sess., 1943. On the relationship of industrial research to the business of A.T. & T. generally, see Danielian, *op. cit. supra*, note 61, at 92 et seq. From his comprehensive study of A.T. & T. (based on F.C.C. hearings, authorized by Congress in 1935, as well as on publications sponsored by the company), Mr. Danielian concludes: "Upon detailed examination of motives and techniques, research, inventions, and patents appear less as sanctified brands of public service and more as weapons of industrial warfare aiming at monopoly." *Ibid.*, third page of Introduction (unpaginated).

⁹⁹ Ex. 125, 2 T.N.E.C. 771, 776 (1939).

¹⁰⁰ *United States v. Aluminum Company of America*, 44 F. Supp. 97, 309 (N.Y., 1941).

¹⁰¹ Quoted in Danielian, *op. cit. supra*, note 61, at 112.

Though Hartford-Empire never licensed anyone to the use of its Peiler air-feeder for the mechanical production of glass containers, the expense of acquiring the Peiler patent was not, from Hartford-Empire's point of view, a complete waste. Hartford got no royalties from the patent; but, possessing it and the financial power to bring infringement suits against more humble enterprisers, Hartford was in a position to keep other firms from using any device which might be covered by the patent. Thus its dominance over the glass container industry was strengthened.¹⁰²

Similarly, Alcoa derived no direct returns from its researches into the fabrication of magnesium, a light metal which is perhaps aluminum's strongest competitor. But because it held some patents, it was able to do business with the other holders of magnesium fabrication patents—Dow Chemical Company and I.G. Farbenindustrie. One consequence of the agreement between Alcoa, I.G., and Dow was that the last named became the only American producer, and its production of magnesium was limited by the terms of the agreement.¹⁰³ Another consequence was that the value of magnesium was not clearly perceived in America until the British shot down some German planes and found that wide use of magnesium accounted for the lightness and efficiency of their motors.¹⁰⁴ Practically unheard of before the war, magnesium is a highly advertised commodity now; we are promised a new magnesium world—everything from feather-weight flivvers to portable perambulators—by producers whom the war has freed of patent controls to produce magnesium by the ton instead of by the pound.

It may be said now that the three "supposes" advanced above and the danger to established firms there implied, were actually pretty far fetched. The patent system is in no sense an enemy to the established firm seeking to maintain its position or to enlarge its scope. When the nature of invention, the character of the patent system, and the facts of industrial life are considered, the threat to established firms appears puny. The patent system then reassumes its identity as one of the best friends monopoly has ever had, and the "threat" it poses may properly be likened to a parental device for strengthening offspring: The danger is not great enough to harm and it is just great enough to stimulate activity resulting in more strength in the monopoly.

The monopoly enters a technological dispute with important ad-

¹⁰² See 2 T.N.E.C. 389-91 (1939).

¹⁰³ On this, see Senate Hearings on S. 2303 at 957 et seq., 77th Cong., 2d Sess. (1942).

¹⁰⁴ See, *Magnesium by the Ton*, 29 *Fortune* 157 (March, 1944).

vantages. Alone in the field for some years, it has achieved respectable financial strength, coherent management, familiarity with its technology, and, perhaps most important, a keen knowledge of the ways of the patent system. The established firm knows that there is no such thing as a complete art covered by one patented invention. It knows too that an unsailable patent has never been issued. With a research laboratory prepared to produce a patentable invention practically at will, and with resources to acquire important patents already issued, that firm is lethargic indeed which allows a competing art a very great start. Once the firm acquires a patent related to the new art, all danger practically vanishes. All the fundamental weaknesses of the patent system then converge, paradoxically, to result in enormous strength and added advantages for the established firm.

The single and basic difficulty of defining an invention for patent purposes shatters into almost an infinity of difficulties when one considers that a single patent never covers a complete art. A radio set, for example, comprehends a number of patents or patentable inventions, some "basic," some "alternative," some "improvements." In advance of litigation no one can tell just where the boundary lines are. Patent litigation means the infringement suit, an unfortunate but necessary excrescence of the patent system,¹⁰⁵ perhaps the most expensive of all legal actions and the most unsatisfactory in result because of the basic difficulty of defining an invention. Expense and unpredictability, essential characteristics of the infringement suit, are properties which make it useless to the small firm or independent inventor; it is too rich for their blood. For the same reasons, however, the infringement suit is, as a recent *Fortune* article has explained, an efficient weapon for the powerful firm bent on domination:

¹⁰⁵ The basic difficulty of defining an invention or an inventor for patent purposes makes a second (or third, or fourth) guess by the courts a necessity. Kottke has explained the situation: "Most frequently," he says, "it is not the cost of obtaining a patent but the expense of litigating it which plays into the hands of those with ample resources. Yet it would be less than fair for the courts not to reopen the case. In the Patent Office the scales are heavily weighted in favor of the applicant. The examiner is not a specialist in the sense in which the applicant is a specialist, and he is allotted only a few hours to test an application which the latter may have taken months to prepare. The applicant has several appeals, the public none. Members of the trade are not informed—their only protection lies in the examiner's brief search. If a patent may put them out of business or divert a good share of their profits it would be unjust to deny them an opportunity to challenge the contention of the patentee that he first conceived the technique upon which others may have based their business." *Electrical Technology and the Public Interest* 39 (1944). The only important thing Kottke has left out is the explanation that this situation is, for all practical purposes, irremediable. An examiner can never be a specialist in the sense that the patent applicant is. If the infringement jurisdiction is taken from the courts, as some persons have suggested, it must be put somewhere. If it is put in the Patent Office, the expense of protecting one's patent would simply be metamorphosed into the expense of obtaining a patent.

The most versatile of all devices . . . is the infringement suit, one of the most expensive forms of litigation. The infringement suit can be used not only as a simple legal action to stop someone from stealing your invention, but also as a controlling device with a range of action all the way from the veiled threat to the punitive war. A competing product, process, or machine is challenged, with or without a clear basis of infringement. If both patents and the patent-owing corporations seem to be of equal weight, the dispute is likely to be settled out of court with a cross-licensing agreement between the two. If the challenged company is fairly small, but its patent sound, it is likely to be forced, in lieu of incurring the expense of trial all the way up to the Supreme Court, to accept a license under the challenger's patent setting rigid price and production limits. This may continue in endless variations with endless controlling results, all the way out to an open reign of terror not only against the alleged infringer but against all of his customers as contributory infringers. A big corporation, working from a base containing as many as 10,000 patents, can usually, if it wishes, find a basis on which to pursue almost any competitor. *More time, money, and energy have sometimes gone into this kind of warfare than ever went into the original technological development.*¹⁰⁶

A.T.& T. discovered the value of the infringement suit early in its career, as appears from the annual report of its patent attorney for 1892. "It appears to me," he wrote, "that the policy of bringing suit for infringement on apparatus patents is an excellent one because it keeps the concerns which attempt opposition in a nervous and excited condition since they never know where the next attack may be made, and since it keeps them all the time changing their machines and causes them ultimately, in order that they may not be sued, to adopt inefficient forms of apparatus."¹⁰⁷

A mere threat of infringement suit by Hartford-Empire was sufficient to eliminate a small Texas firm whose president said, in explaining the "voluntary" liquidation: "I realized that we couldn't pay \$100 or \$150 a day to stay in the federal court."¹⁰⁸ Even Hazel-Atlas, a fairly strong firm in the glass container industry, preferred entering the cartel to pouring more money into the seemingly bottomless pit of infringement litigation.¹⁰⁹

When Dow Chemical Company spurned Alcoa's invitation to enter upon a career of restricted production, the infringement suit was hauled out as a means of bringing Dow into line, even though the Alcoa people had "no definite proof of infringing acts." In 1932 W. D. Keith of Alcoa

¹⁰⁶ War and Peace and the Patent System, 26 Fortune 105, 132 (Aug., 1942). Italics added.

¹⁰⁷ Quoted in Danielian, op. cit. supra, note 61, at 98.

¹⁰⁸ Testimony of S. A. Coleman, president of Knappe-Coleman Glass Co., 2 T.N.E.C. 613 (1939).

¹⁰⁹ See Part I of this article, at 86.

wrote to Walter H. Duisberg of Alcoa's subsidiary, Magnesium Development Corporation:

In my mind, the situation is not very complicated. Dow is either going to play with us or is not going to play with us. If they do not play with us, we have two courses before us. One is to enter into an oral argument over the entire industry with Dow. The result of this argument would simply be that a great deal of time, paper, and energy would be wasted to no particular effect. The other course is to sue Dow with two objects in view, the first object being to bring Dow to terms, the second object being to actually prosecute the suit to its logical end.¹¹⁰

Unable in the nature of things to perform its stated function of encouraging and rewarding inventors, the patent system seems to have undergone a metastasis. Its major utility lying in the coercive power it embodies, the patent system has become a key factor in the progress of industrial regimentation.

III

Out of the chaos created by the patent system, dominant firms wielding the infringement suit erect a kind of order—"order" imposed by brute force articulated on the legal content of the patent grant. In aiding the establishment and maintenance of this "order," the full extent of the departure of the patent system from its ostensible purpose is evident. Even without continuing patent protection, large aggregations of industrial power tend naturally to inhibit technological change.¹¹¹ *With* patent protection and the tools for domination provided by the patent system, the naturally inhibitory character of large-scale organization is heightened, and general inhibition or confusion of inventive processes results. The essence of the patent is the right to exclude; subordinate essences are the rights to fix prices and to restrict production, quantity-wise or geographically. Bolstered by these essential rights, individual patentees are in a position to frustrate the development of a new art, and combining patentees may cartelize substantial portions of both national and international industries, until the inhibitory character of large-scale organization may exist even in industries where there is some relatively small-scale production.

The case of beryllium, a vaunted light metal, recapitulates the phylogeny of the patent system—from basic confusion to cartelization. Andrew J. Gahagan, president of the Beryllium Corporation of America, had at one time thought his firm the pioneer in its field. Upon discovering,

¹¹⁰ Ex. 19, Senate Hearings on S. 2303 at 1057, 1059, 77th Cong., 2d Sess. (1942).

¹¹¹ For an account of the obstacles to the introduction of new procedures in established businesses, see Bichowsky, *Industrial Research* ch. v (1942).

however, that beryllium fabrication had been worked out rather thoroughly and patented by the German firm, Siemens & Halske, Mr. Gahagan found himself in an uncomfortable position. "I wanted a license under [the Siemens] patent," he explained, "and [to] license them abroad under any of our patents abroad, or at least exchange information and co-operate closely. . . . [But] they apparently had no great interest in the beryllium business¹¹² . . . so after about three years I concluded that I wasn't getting anywhere. . . ."¹¹³ This left Mr. Gahagan in an unsatisfied state. "I had various conferences with the representatives of Siemens & Halske," he went on, "and I couldn't find out whether Metal and Thermit owned the patents or whether they didn't own them, or whether Siemens were going into the beryllium business in the United States or whether they were not going into the business."¹¹⁴ Mr. Gahagan then revealed the serious danger to his business that this situation contained:

. . . by this time we had spent considerable money and a few years' work; if we continued the development we might find after five or ten years a lot of overhanging patents, owned by Siemens, which would be held against us and we would be told some day, "Well, you can't operate any more," or "you can't make beryllium-copper and heat treat it . . ." and so forth, and the customers we had, or hoped to have in the future, might also be embarrassed.¹¹⁵

Beryllium Corporation had two choices: either to go out of business, thus avoiding the risk of infringement suits by a corporation immeasurably its superior in resources, or to do business with that firm on suitable terms. Beryllium Corporation and Siemens made a deal. Their agreement split the world between them, each party granting the other an exclusive license in its respective territory. Among other things each party agreed to refrain "from assisting third parties in producing beryllium except subject to the provisions of [the] agreement." Elaborate arrangements for cross royalties based on "average prices" indicate that rough price-fixing was probably another object of the agreement.¹¹⁶

In the absence of patent (or other governmental) protection, a monopoly or cartel faces almost certain long-run disintegration because it cannot keep out new enterprise attracted by artificially high profits. With patent protection, however, the cartel's only threat is the possibility of a successful antitrust suit (in which case we observe the somewhat puzzling spec-

¹¹² The German firm seems actually to have been quite interested in the possibilities of beryllium, and was apparently trying to give Mr. Gahagan the runaround. See 5 T.N.E.C. 2026-7, and Exs. 477-8, *ibid.*, at 2276-8 (1939).

¹¹³ *Ibid.*, at 2025-6.

¹¹⁴ *Ibid.*, at 2038.

¹¹⁵ *Ibid.*

¹¹⁶ Ex. 481, *ibid.*, at 2279-83. See especially secs. 4, 8-14 of the agreement.

tacle of governmental sanction followed by destruction), or a war with strong and belligerent outsiders (in which case a new, larger, and more powerful cartel usually results). Thus, over the years, the patent system has been the best protector as well as builder of monopolies and cartels, and the varied consequences of its protection have one thing in common: they are all undesirable in a society seriously concerned with approximating and maintaining traditional ideals of free enterprise and free competition.

Perusal of government publications, Department of Justice releases and complaints, recent books, and newspaper accounts reveals that cartelization predicated on patents has developed to an almost incredible extent.¹¹⁷ National and international businesses and businessmen have been tied up by elaborate licensing agreements, until the business of production and the business of technological advance have been subordinated to the business of maintaining existing arrangements and relative positions. Inventive activity has not ceased, but it has been harnessed to monopoly, to the task of dragging "organized" industry through the ruts it has dug. Production has been stabilized along feudal lines; the traditional independence of the small-scale enterpriser, if it ever actually existed, exists no longer in fields where technology is dominant enough to call into play the full operation of the patent system. For then the small firm exists only by sufferance. The large firm with its formidable patent structure and the weapon of the infringement suit is in a position to snuff out any upstart who cherishes notions of independence in price or production policies.

Dependent upon the dominant firm for their existence, and comfortable in the security it provides, subordinate firms have come to delegate to the leader in an industry the function of strengthening the patent cartel. The leader insures its dominance, in turn, by inhibiting technological activity on the part of its subordinates. Thus a license from Hartford-Empire usually contained a clause requiring licensees to assign improvements on patented machines to Hartford.¹¹⁸ And now, after the Government has obtained a decree requiring Hartford-Empire to liberalize the terms of its licenses, some licensees have refused to accept the more liberal terms. Discussing this problem, Mr. Justice Roberts said:

¹¹⁷ Mr. Berge, Assistant Attorney-General in charge of the Antitrust Division, has said that "in every cartel arrangement which has come to the attention of the Antitrust Division of the Department of Justice technology has been a vital factor." *Cartels: Challenge to a Free World* 35 (1944). A summary of the outstanding cases may be found in part 6 *Hearings on S. 702 at 713 et seq.*, 78th Cong., 1st Sess. (1943). See also Edwards, *Economic and Political Aspects of International Cartels*, Monograph No. 1, a study made for the Senate Subcommittee on War Mobilization, 78th Cong., 2d Sess. (1944).

¹¹⁸ See Part I of this article, at 90, note 46.

"Hartford can be enjoined from enforcing the restrictions [in its licenses] if that is found necessary."¹¹⁹ Having adjusted themselves to the paternalism of the dominant firm, these rugged individualists either cannot make their own way any longer, or they fear the type of reprisal which no court decree can prevent after the patent system has placed tremendous strength in one firm, or they are making another stab at maintaining the cartel, whose comfort the patent system taught them to cherish.

Relatively small businesses in electrical technology are exposed to similar conditions. Firms licensed under General Electric's incandescent-lamp patents must promise to license G.E. without further consideration under all related patents which they own or are privileged to sublicense; though the licenses *from* G.E. may be for short terms, the licenses *to* G.E. are for the life of the patent concerned.¹²⁰ Obligated to license the strongest firm in the industry, when that firm is under no similar obligation, the small company's incentive to invent is probably inhibited, and if the incentive to invent is not completely inhibited, the incentive to get patent protection is. For patent protection is an expensive business, and if a patent once obtained must be made available to a strong firm, which has no reciprocal obligation, the patent system offers no attraction at all. Speaking of the operation of the patent system generally, the author of a recent study of the electrical products industry pointed out that "the cost and uncertainty of patent litigation greatly impair the value of patents as an incentive, and occasionally they are a deterrent rather than a stimulus to improvement."¹²¹ Small firms working in electrical technology, the same author said, "are persuaded, usually after unsatisfactory experiences with patent litigation, that they would be unable to protect whatever rights they might obtain."¹²² As a consequence, this writer continues, "some small concerns no longer apply for patents."¹²³

Thus patent strength is concentrated in the dominant firms which then possess absolute power over what has become, through the agency of the patent system, a closed industry. The inevitable consequence is that of all "closed shop" arrangements: members of the closed shop become so preoccupied with their own immediate security that dynamic productivity, which alone can insure general security, is gradually forgotten. "If a plausible case of overcapacity [in electrical technology] could be made out," Kottke predicts, "the industry would countenance denial of licenses

¹¹⁹ *Hartford-Empire Co. v. United States*,—U.S.—(1945), 65 S. Ct. 373, 391, n. 22 (1945).

¹²⁰ Kottke, *op. cit.* *supra*, note 105, at 57.

¹²¹ *Ibid.*, at 130.

¹²² *Ibid.*, at 41.

¹²³ *Ibid.*, at 130.

to newcomers, and price maintenance usually would be welcomed."¹²⁴ The rigid hegemony, structurally and psychologically dependent on patent protection, therefore creates conditions wherein a recession of business activity is subject to immediate and far-reaching aggravation. Speedy retrenchment and sticky prices are bound to come when they can be accomplished, in accordance with the already coordinated desires of existing producers, merely by making legally enforceable adjustments in patent licenses. The sins of the patent system are manifold.

But the evils created by the patent system do not end with the inhibition of invention and the creation of depression-aggravating cartelization. The basic futility of attempting to define "an invention" for patent purposes manifests itself again in monstrous confusion when several powerful firms have intersecting operations. In the field of radio, some of the strongest corporations in the world found themselves, not entirely by accident of course, in an impenetrable patent tangle.¹²⁵ Dovetailing and conflicting patents were held by A.T. & T., General Electric, Westinghouse, United Fruit Company, and others. No firm could produce a good radio, not because it did not know how, but because the patent system would have subjected it to the devastating expense of patent litigation. The respective corporations-in-interest were not greatly harmed by the frustration resulting from the basic inadequacy of the patent system; they were successfully engaged in monopolistic activities in other fields. Only the new art suffered real harm; its exploitation was set back several years at least. Indeed, had not the United States Government interceded to promote a reconciliation for war purposes, the mutual frustration might have continued much longer than it did.¹²⁶ The preamble to the pooling agreement indicates the character of the conflict:

... each party is in possession of information, patents and inventions applicable to, and has research organizations engaged in investigations bearing upon, not only its own business but also the business of the other party; and

... various patents or applications for patents of the parties are involved in interference with each other in the United States Patent Office;

... the restrictions upon each party imposed by the patent rights of the other and the uncertainties arising out of interferences have tended to, and if permitted to continue, will hamper and delay progress in the development and production of wire and wireless telephone and telegraph apparatus and systems; and

... the effective and prompt development of the arts in question can be secured

¹²⁴ *Ibid.*, at 128-9.

¹²⁵ See Danielian, *op. cit. supra*, note 61, at 107-13; Wood, *Patents and Antitrust Law*, 128-37 (1942).

¹²⁶ See Danielian at 109, *et seq.* The Government's intercession actually produced only a temporary compromise.

only by the free and frank cooperation and exchange of information between the parties, which can not well take place if improvements and knowledge resulting from one party's cooperation with the other party may without its consent be made available in its field to the use of others. . . . ¹²⁷

The radio trouble was later mirrored in television, where some of the same parties were again at odds. Philo T. Farnsworth, inventor of one of the basic television processes, testified before the T.N.E.C. that television "has grown up so interwoven that part of the patents belong to RCA, part belong to us, part belong to Bell Telephone. . . . Several of the fundamental patents are ours and I think several of the fundamental patents are RCA's also. . . . It is not possible to build a television receiver without working under our patent; it is not possible to build a television receiver, in my opinion, without working under RCA license."¹²⁸ If the new art is to be developed at all, under such circumstances, the parties in interest must combine their patents. Such combination calls for elaborate agreements, designed to safeguard the interests of the established firms concerned. The tendency in such agreements is to fix the development of the art in accordance with the desires of the dominant bargaining parties. Lines of force are laid with the primary emphasis, not on the development of the new art, but on the perpetuation of established strength.¹²⁹

In a world where change cannot be suppressed, even by the patent system and the elaborate agreements it produces, those agreements do not necessarily lead to smooth and rapid development of the art they cover; and, in the case of an art related to but not covered expressly by the subject matter of the agreement, they only heighten the basic confusion and cumulate the obstructions to technological development. Concrete examples of the obstructions which elaborate agreements cannot eliminate are presented by the careers of sound-movie equipment and synthetic rubber.

As a consequence of past pooling agreements, A.T. & T. and R.C.A. found themselves jointly possessed of the basic patents on sound-movie apparatus.¹³⁰ Each was in a position, therefore, to develop the field. Since their former agreements had not included the situation presented by the new art, however, obstructions similar to those characterizing the radio conflict arose, and development of the new art was once again frustrated

¹²⁷ Quoted, *ibid.*, at 110.

¹²⁸ 3 T.N.E.C. 1004 (1939).

¹²⁹ See the Jewett memorandum cited *supra*, note 98.

¹³⁰ For an extended treatment of the facts cited in this and the following paragraph, see Danielian, *op. cit. supra*, note 61, at 138-72.

while the dominant firms jockeyed for position. A.T. & T. tried every conceivable device to keep R.C.A. out of the sound-movie field, even arguing that its attempts to keep movie producers from using R.C.A. equipment were motivated by its well-known desire to maintain high standards of performance. Since R.C.A.'s equipment was based on the patents used by A.T. & T., however, and since objective tests indicated that both types of equipment were equally good, another motivation must have accounted for A.T. & T.'s conduct. This motive, as appears from a memorandum written by an A.T. & T. official, was no more or less than the constant motivation to greater monopoly power:

In the talking motion picture field, they [R.C.A.] are competing very actively with us at present, as you know, to develop an affiliation with the large motion picture producers and competition between us will doubtless ultimately result in a situation highly favorable to the motion picture interests and opposed to our own. This is an extensive and highly profitable field and it is quite worth our while to go a long way toward making it practically an exclusive field. I believe that we could justify, from a commercial standpoint, paying a large price for the liquidation of the Radio Corporation for this purpose alone.¹³¹

Once again the patent system provided the weapons for the battle. All the tricks with which the patent system endows its monopoly offspring—tying clauses, subtle hints of contributory-infringement suits, “double royalty” clauses, service-repair-and-replacement provisions, etc.—were used to discourage the purchase of R.C.A. equipment. But once again the only significant consequences of the dispute were delay in the exploitation of the new art and confusion in its development. R.C.A. finally shared the field with A.T. & T.

The foregoing situation was simple and innocuous in comparison with the one recently prevailing in the synthetic rubber field.¹³² In this field, more than in any other, the fallacious assumptions of the patent system are laid bare, and the consequences of its simple-minded view of inventions and the inventive process show that it cannot be tolerated, if we are to have unrestricted production and rapid development of new processes. Here the patent system has worked industry up to a crescendo of confusion, and the consequences in terms of critical wartime shortages are even more painfully evident than are those in light metals. The scope and character of the confusion may be conveyed by naming the principal parties to one of the many major agreements which wartime production of synthetic rubber made necessary. Among the original parties to one of the

¹³¹ Quoted, *ibid.*, at 143.

¹³² See generally, Senate Hearings on S. 2303 at 2621 et seq., 77th Cong., 2d Sess. (1942).

agreements pertaining to the manufacture of butadiene were the Rubber Reserve Company, Universal Oil Products Company, Standard Oil Development Company and Jasco, Inc., Shell Development Company and the M. W. Kellogg Company, Humble Oil & Refining Company, Koppers Company and Koppers United Company, Shell Oil Company and Shell Chemical Company, Carbide and Carbon Chemicals Corporation, Phillips Petroleum Company and the Lummus Company, Celanese Corporation of America, Standard Oil Company of Louisiana, Hycar Chemical Company and the B. F. Goodrich Company, the Dow Chemical Company, and the United Gas Improvement Company. This agreement covered only that part of the synthetic rubber field concerned with the manufacture of butadiene from butane, butylene, acetaldehyde, ethyl alcohol, propylene and formaldehyde, benzene, and hydrogen, or mixed gases containing butadiene in recoverable proportions.¹³³

To get synthetic rubber into mass production, the national government has had to force a reconciliation between various patentees. Goodrich and Goodyear, for example, companies which had done substantial research in synthetic rubber, hesitated to do business with Standard Oil, because the licenses it offered provided for cross-licensing improvements. They are said to have feared the kind of dominance which Hartford-Empire had secured over the glass-container industry by similar licensing provisions fortified by tremendous resources and an already powerful patent position.¹³⁴ Thus, for fear of the monopoly power so easily constructed on patents, the rapid development of a new and necessary art was subordinated to other considerations; as ever, the business of production was frustrated by the tactics of monopoly fostered by the patent system.

Blithely operating on the principle that single inventions are self-sufficient and marketable, the patent system has thus made rapid development of a technologically complex field practically impossible. Its basic assumptions unfounded, the system necessarily creates confusion and the possibility of unending obstruction. *Fortune Magazine* has shown in a vivid and accurate description what patents have done in a newly exploited art:

Probably the most complex pattern of all is the technically fast-moving oil industry, where a Topsy patent system has grown out of the sheer give and pull of necessity.

¹³³ See The Government's Wartime Research and Development, 1940-44, Report No. 5 from the Subcommittee on War Mobilization to the Senate Committee on Military Affairs 249-50 (1945).

¹³⁴ See Hearings on S. 2303 at 2635, 77th Cong., 2d Sess. (1942).

Hundreds of patents are issued annually on basic processes, parts of processes, competing products, equipment, techniques, catalysts, and endless improvements on each, with ownership inextricably mixed among all the major oil producers and development companies. To operate at all, the industry has spun a nightmare web of licenses, cross licenses, patent-holding companies, pools, immunities, and "hold harmless" devices—so tangled and organic a growth that the forbidding chart on page 104 is probably the first attempt ever made to diagram it. Clearing some new processes out of the tangle into wide-scale war production in high-octane gasoline, toluene, and butadiene has had both the industry and government in knots.¹³⁵

It is often impossible to tell which patents are key patents in a complex and rapidly growing art; hence the holder of any patent, if he has weight and swings it properly, may block a whole line of development; and even if no conscious attempt at frustration is made, the mere presence of conflicting, legally enforceable rights makes for confusion and obstruction. In a developing technology there may be hundreds of important patents to be reckoned with, each representing a hazard to smooth development of the art. Facing such facts, one may well ask with Mr. Alfred E. Kahn, author of the article, "Fundamental Deficiencies of the American Patent System": "Can the sweep of modern technology withstand the restrictive force of a hundred patents covering a hundred minute individual efforts in that growing process we call a 'product'?"¹³⁶

"The proof that it cannot," Mr. Kahn continues, "is that industry after industry had been checkmated by the patent law and has been forced to set aside the individual patent both as a basis for production and as a stimulus and reward for invention."¹³⁷ In an attempt to avoid its frustrating difficulties, various industries (e.g., aircraft, radio, automobile)¹³⁸ have essayed modifications of the patent system with respect to their own operations. These industries have eschewed, to some extent, the essential patent prerogative—the right to exclude—hoping thereby to minimize the obstructions which thoroughgoing pursuit of the patent right creates. Significant as it is for an evaluation of the patent system, such private and unilateral modification has its limitations. If compulsory licensing of pooled patents were a well-established doctrine in patent law, existing firms might be trusted with the power which charter membership

¹³⁵ War and Peace and the Patent System, 26 *Fortune* 134 (Aug., 1942).

¹³⁶ Kahn, *Fundamental Deficiencies of the American Patent System*, 30 *Am. Econ. Rev.* 475, 482 (1940).

¹³⁷ *Ibid.*

¹³⁸ On aircraft, see Wood, *Patents and Antitrust Law* 148-50 (1942). On automobiles, see *ibid.*, at 145-8; Kottke, *op. cit. supra*, note 105, at 17. On radio, see Wood at 135-7; Kottke at 86, 92-3.

in a pool gives them.¹³⁹ This condition does not exist, however, and the open pool is consequently subject to the same kind of objection that the outright cartel evokes. Essentially pre-empting the function of the Patent Office, a pool controls the destiny of its constituents and the art it governs; representing the combined strength of the industry, it is subject to the suspicion which all extragovernmental concentrations of power should excite.

These considerations aside, there are still other things which militate against choice of the pool as a satisfactory method of neutralizing the evils of the patent system. Members of a pool must still cope with the restrictive power latent in the present patent system. Safe from disputes with fellow-members, the member of a pool still has no guarantee against disputes with nonmembers. There is no way to avoid such conflicts and their undesirable consequences as long as the patent system exists, for the patent system forces itself upon the members of all industries in which there is technological change. No producer has a choice between taking or not taking out patents; patents must be acquired, if only for defensive purposes.

Even members of the automobile industry, which has gone furthest in renouncing the "protection" of the patent system, find themselves confronted with its difficulties. Thus, in a statement of policy prepared by patent counsel for General Motors Corporation, it is said:

Neither the Corporation nor any of its subsidiaries ever purchased any patent unless it was felt necessary to do so to protect some article or device, or part thereof, they intended to manufacture. . . . [Patents] were taken out, not because the Corporation intended to exploit them against its competitors, but to protect itself against persons who might think of the same thing and obtain a patent thereon and then sue the Corporation for infringement.¹⁴⁰

Once in the game, however, all the harassing consequences follow. Though G. M. professed acquisition of patents only for defense, it was nevertheless involved in 446 interference proceedings between 1922 and 1937.¹⁴¹ Possession of patents leads naturally, moreover, to attempts to enforce the rights they embody, and so General Motors has had its fling at the infringement suit. Unlike other large and well-established firms, however, G. M. has not found the infringement suit a desirable weapon; "the re-

¹³⁹ *Fortune Magazine*, perceiving the drift, has said: "In the long view . . . war and reconstruction and the whole force of modern technology are moving inexorably toward some form of compulsory licensing, because pools cannot be regulated for the best social and technical ends by any milder reforms." *War and Peace and the Patent System*, 26 *Fortune* 138 (Aug., 1942).

¹⁴⁰ Ex. 104, 2 T.N.E.C. 691 (1939).

¹⁴¹ *Ibid.*, at 692.

sults accomplished have not at all been commensurate with the expense."¹⁴² Between 1924 and 1937, patent litigation cost G. M. about \$3,000,000.¹⁴³

We have seen that the patent system has not dealt, and probably cannot deal, adequately either with rewarding inventors or defining invention. We have seen also how the patent system's basically inadequate conception of invention assists and even makes necessary the growth of monopolistic organization, with its concomitant stifling of invention; how the patent system places a premium on enormous industrial strength in other ways, with the consequences that in an important technological field free enterprise is impossible and patents offer no incentive to any but the strongest firms. We have seen, finally, how the basic inadequacy of the patent system's conception of invention has created conditions which tend to clog the whole process of commercial exploitation of invention. It remains now to point out a further and perhaps more profoundly dangerous consequence of the operation of the patent system. Still in embryo, this vice of the system, "generated on the dung of other vices," is nevertheless worthy of observation.

Modern technology is based on fundamental discoveries in the natural sciences. Disinterested observation and experimentation are probably the most favorable conditions for scientific research; another important element in the growth of fruitful discovery is the free dissemination of the products of scientific research. These conditions find approximate realization in those universities which see as their business the finding and propagation of important facts about nature, man, and society.

Without providing an equally appropriate substitute, the patent system tends to weaken the position of the university as the perfect sponsor of scientific research. The patent system has built monopolies and encouraged them to create vast industrial laboratories; it has endowed them with the means of expanded research programs by putting them above the reach of competition. To the extent that it is responsible for the extravagant growth of the industrial research laboratory, the patent system draws men from universities, where they are paid to do disinterested research and to publish their results, and puts them in industrial laboratories, where their primary function is, or should be, to strengthen the industrial position of their employer.¹⁴⁴

¹⁴² *Ibid.*

¹⁴³ *Ex. 106, ibid.*, at 700.

¹⁴⁴ Dugald C. Jackson, professor of electric power production and distribution at Massachusetts Institute of Technology, wrote in 1932: "It is estimated that there are now in the neighborhood of thirty thousand research workers directly attached to technological prob-

The enormous research expenses of the modern industrial giant are paid for, of course, by the public, and thus the industrial laboratory gets social support which might otherwise go to the universities, whose relatively disinterested position makes them more appropriate agencies for the accumulation and dissemination of knowledge. The private firm is, and should be, concerned with strengthening its own position; if the public desires to support the pursuit of knowledge, therefore, its money is best spent by institutions whose function it is to engage in that pursuit. To the extent that industrial laboratories depart from policies of strengthening themselves in their research, they distort their own function; in a private-enterprise economy, the business of the private firm is to maximize its own profits.¹⁴⁵ There is no proper place for disinterested research by private firms in this system, and, their publicized protestations to the contrary notwithstanding, the chances are that none of our large industrial laboratories is engaged in the sanctified pursuit of truth for its own sake.¹⁴⁶

An even greater danger to the advancement of knowledge is that the patent system may alter the university's conception of its own function.

lems, and that only about five hundred investigators are supported in the less restricted research of university laboratories and research foundations. The ratio is disquieting. Multiplication of the five hundred is a need. The fertility of industry is likely to wane unless new knowledge may continue forthcoming at a rate which is in suitable keeping with the rate of industrial application; and unless new means for making the applications are constantly in review." See the essay by Professor Jackson, *The University Laboratory as a Partner of Industry*, printed as ch. ix in Ross (ed.), *Profitable Practice in Industrial Research* 177 (1932).

Industrial research has sometimes called for extremely large budgets. A.T.&T.'s research, for example, is said to have cost \$250,000,000 between 1916 and 1935. In 1939 the Bell Telephone Laboratories alone had 3,669 employees, including 1,665 engineers, 273 physicists and metallurgists, 336 technically trained assistants, 328 draftsmen, and 60 patent solicitors. See Kottke, *Electrical Technology and the Public Interest* 52 (1944). Bennett, *The American Patent System* 184-6 (1943).

¹⁴⁵ Frank B. Jewett, president of the Bell Telephone Laboratories, has said: "... there is a vital distinction between the university research laboratory and the one which can best serve industry. This distinction is involved in the *motive* behind each. It is a distinction so vital that any serious attempt to transfer the functions of one to the other, or even to make one serve the functions of both, is more than likely to prove disastrous to each. . . .

"... the industrial research laboratory is part of a mercantile machine and its main objective must necessarily be the solution of purely utilitarian problems. In other words, it must of necessity concern itself essentially in cultivating for profit those regions discovered and mapped out by the academic experimenters in the fields of the fundamental sciences." In Ross (ed.), *Profitable Practice in Industrial Research* 7-8 (1932). See also the essay by L. A. Hawkins, Executive Engineer in General Electric's Research Laboratory, *ibid.*, at 63, 68

¹⁴⁶ "Research in the university and in [for example] the General Electric Company are two vastly different things; regardless of how much publicity men try to smooth this fact over." Bichowsky, *Industrial Research* 93 (1942). "The truth is that there is seldom justification for an *industrial* laboratory to work on problems for which an immediate commercial need is not seen. To work on soap films just for the fun of it or to increase the sum of human knowledge is not good business or good sense except under certain conditions." *Ibid.*, at 111-2.

Tending to draw science from the universities, the patent system may "balance things" by inserting itself in the vacuum. The past susceptibility of the universities to revenue producing possibilities suggests that this fear is not visionary, and indeed the patent system has already entered universities. Those universities which pursue or encourage their members in the pursuit of patents, invite the same departure from disinterested research which is characteristic of the industrial laboratory. The university professor whose research is oriented in terms of patent protection inevitably loses the quality of disinterestedness. Research aimed at a patent necessarily departs from the "basic" level, for discovery of a "natural principle" is not patentable. Since a patent will not issue for an already published discovery, moreover, pursuit of a patent negates that other desirable feature of university research, the free dissemination of its findings.¹⁴⁷

When and if universities pursue organized patent programs, there will be few institutions which pay men to do strictly disinterested research of a basic character. Under such circumstances there will probably be little basic research, and a first class irony will then exist. Established to promote the arts and sciences, the patent system, which has already frustrated the commercial exploitation of invention, will also have dried up its well-spring.¹⁴⁸

¹⁴⁷ The conflict between the patent system and publication of the products of research is illustrated by the following excerpt from a memorandum from the files of the General Electric Company:

"We do not know exactly what system the Osram Company have in regard to looking over articles by their employees before publication. As you know, we have in this country a rigid routine which provides that all articles written by our employees before publication must be submitted to the Patent Department in order to see that no statements are made which may affect our patent situation. I presume that the Osram Company has a similar routine. In this particular instance, there might be a minor complication in that we have our license under the Schroeder U.S. patent from Krupp. Therefore, it might seem that Krupp should exercise some sort of censorship also. Primarily, however, it seems to me that the Osram Co. Patent Department should be responsible for looking over articles written by its employees." Lewin Exhibit No. 70, Senate Hearings on S. 2303 at 412, 77th Cong., 2d Sess. (1942).

¹⁴⁸ The need is for attitudes and actions which the patent system frustrates—greater stability, more sensible exploitation, the productivity associated with competition, and broader and deeper "pure" scientific research. These requirements are antithetical to the present era of gaudy gadgetry, proceeding from the distortions of all types of productive activity traceable to the patent system. On this question generally, see the essay written (in collaboration with L. A. Hawkins) by the renowned Director of Research of the General Electric Company, Mr. Willis R. Whitney:

"We in America are generally superficial. The lives of a few exceptionally able American inventors have led us to overprize engineering short cuts. We are patenting inventions at the rate of nearly 50,000 a year, but few Americans are advancing the sciences at all. . . . During the past century there appeared in European countries men who devoted their entire time to study in fields of new knowledge. Their lives were spent in their laboratories and all that they learned was freely published. They did not confine their teaching to talks about the works of

IV

"The business of government," Woodrow Wilson once said, "is to see that no other organization is as strong as itself; to see that no group of men, no matter what their private business is, may come into competition with the authority of society." This corollary of the axiom upon which representative government is traditionally rationalized, never encounters a straightforward challenge; but the facts of life reveal that it is often disregarded. We have resoundingly renounced the proposition in practically every important area of the economy, and instead of government by duly constituted authority, we have government by private groups—no matter what their business is.

If there is a common ideal underlying the various political and economic theories characteristic of America, it is, stated in the broadest sense, the ideal of individual self-realization, conditioned by free access to the resources of society. Since "the individual" means potentially *every individual*, achievement of the ideal requires organized action to the end that opportunity for self-realization remain open to all. Furthermore, since the existence of society is the condition precedent of self-realization ("success" as we know it is impossible outside society), the criterion of success in a nonexploitative system must be that of service to the society; briefly put, "the most of the best (at the cheapest price)." Three entities are therefore involved—the individual, society, and government. And the relationship among them may be sketched in this way: for the individual, opportunity; for the society, service; for the government, the job of maintaining the conditions wherein both the individual and society are thus served. With specific reference to a largely "private"-enterprise economy, the ideal requires a government vigilant to maintain freedom and equality of opportunity for the individual to reach economic success through efficient service of the public need and desire for material goods. A long step forward may be taken by adding that this is only the theory of free, competitive enterprise, stated in terms which reveal it as simply a device for serving, simultaneously, the individual and the common good.

The foregoing seems to be a fair statement of the theory of representa-

others. . . . If we search for a reason why so many scientific pioneers developed in Europe, rather than in America, we discover that they are the products of a system. Each was freed to evolve himself and follow his studies along the lines he chose, and he was given the assistance of students who were at the same time learning the value and rare power of careful thought and painstaking investigation. . . . It is for such reasons that we want to see more chemists and physicists trained in our schools than are absorbed in our industries. We need them much more generally in scientific research laboratories, in the college or elsewhere, where the country's future interests are concerned." Profitable Practice in Industrial Research 247-8, 250 (1932).

tive government and free enterprise. Yet, it takes little insight to recognize that the lawmakers of the United States have not addressed themselves in a workmanlike manner to the achievement of the ideal. We have renounced it to accept government by private groups, and the renunciation has operated, with an almost divine malice, to the detriment of people in general. It has created vast concentrations of power, encrusted them with bulwarks which render attack most difficult, and made the socially desirable ideal of free competition within functional groups a dreadful idea to those groups and almost an excrescence in the eyes of society. By the delegation of governmental power to private enterprises, furthermore, that perverse conception has arisen which makes of competition a self-consuming process, until we find that free competition must inevitably mean "no-competition." This is nowhere more clearly expressed than in the dictum of Mr. Justice Holmes:

It is plain from the slightest consideration of practical affairs, or the most superficial reading of industrial history, that free competition means combination, and that the organization of the world, now going on so fast, means an ever increasing might and scope of combination. It seems to me futile to set our faces against this tendency. Whether beneficial on the whole, as I think it, or detrimental, it is inevitable, unless the fundamental axioms of society and even the fundamental conditions of life, are to be changed.¹⁴⁹

Pushed by the concerted action of interested groups, and unresisted by people impressed with the attitude of Mr. Justice Holmes, the tendency toward combination has enjoyed a veritable heyday. The simple phenomenon of strengthening one's own position, at the expense of both incipient competitors and society as a whole, has not only been tolerated, but lauded, outfitted with the raiment of an inexorable law of nature, and solemnly justified on economic grounds as socially desirable because of the efficiency of big business.¹⁵⁰

In the important areas of the economy—in tariff regulation, corporation law, labor law, fiscal and monetary policy, patent law—there has been a great muddle;¹⁵¹ the Government has failed to establish clear, just

¹⁴⁹ *Vegeahn v. Guntner*, 167 Mass. 92, 108 (1896).

¹⁵⁰ Among the assumptions underlying modern society, according to one rather influential book, are the following: "That large aggregations of capital are not inconsistent with the doctrine of free competition, but are, indeed, inevitable and socially desirable; that the individual workers must combine in order thereby to achieve the possibility of free competition with concentrated capital. The task of law, whether expressed by judicial decision or newly formulated by statute, is to accept or reject concretely the implications of these assumptions." Frankfurter and Greene, *The Labor Injunction* 204 (1930). Recent trends in labor law indicate that the implications of these assumptions have been accepted.

¹⁵¹ The author believes that the distortion and the chaos visible in the patent system are only symptomatic of an illness manifest in all the cases mentioned in the text, and that the

rules, within which competitive forces could regulate the nation's industry for the general welfare.¹⁵² This neglect of even the minimum responsibility placed upon government by the wisdom of *laissez faire* has bred chaos; and from chaos, enormous aggregates of financial, industrial, and political strength have emerged to dominate the scene and thus to compete with and often to vanquish the authority of society. Meanwhile, in industries where no giants have developed, moderate-sized firms, uninhibited by any thorough-going attempt by the Government to maintain competitive conditions, have erected petty cartels in order to escape the rigors of competition. Where it is impossible to keep out new investment,

basic evil is not one that defies understanding. The basic evil is that different individuals have used government to further their own immediate ends, regardless of social consequences. Thus, the power of government has been encouraged and courted, at times, by the same people who have taken the general position that the role of government should be a "minor" one. This is most evident in the case of tariffs, the abolition of which is still opposed by the National Association of Manufacturers. In the labor field, likewise, since the nineteenth- and early twentieth-century antipathy has disappeared, and since there are now concentrations of labor power analogous to those of capital, at least one spokesman for the National Association of Manufacturers has courted the national power, seeking stringent regulation of labor activity. See the address by H. W. Prentis, Jr., *Government's Place in Postwar Labor-Management Relations* (1944), printed by the N.A.M.

The stand against governmental action in the field of corporations has been more unequivocal, and successful. The function of governing corporations has been delegated to the individual states; they in turn have delegated the function to the interested corporations; and thus the corporation has become a law unto itself. Corporate structures have consequently become so vast and intricate, and corporate finance so esoteric, that only a few people can comprehend their significance. These people are usually in control—control so far removed from either equitable ownership or productive activity, that monstrous bureaucracies are necessary for any kind of operation at all. This is the result of maintaining a healthy simplicity in government.

The same general phenomenon and its effects on the monetary system have been described by Economics Professor Henry C. Simons of the University of Chicago, who, casting about to describe the worst possible monetary system, in terms of the conditions necessary to free industry for its job of efficient production, found himself practically describing the status quo:

"Tolerable functioning of a free-enterprise system presupposes effective performance of a fundamental function of government, namely, regulation of the circulating medium (money). We should characterize as insane a governmental policy of alternately expanding rapidly and contracting precipitously the quantity of paper currency in circulation—as a malevolent dictator easily could do, first issuing currency to cover fiscal deficits, and then retiring currency from surplus revenues. Yet that is essentially the kind of monetary policy which actually obtains, by virtue of usurpation by private institutions (deposit banks) of the basic state function of providing the medium of circulation (and of private "cash" reserves). It is no exaggeration to say that the major proximate factor in the present crisis is commercial banking. This is not to say that private bankers are to blame for our plight; they have only played the game (and not so unfairly, on the whole) under the preposterous rules laid down by governments—rules which mean evasion or repudiation by governments of one of their crucial responsibilities." Simons, *A Positive Program for Laissez Faire*, Public Policy Pamphlet No. 15 at 14-15 (University of Chicago Press, 1934).

¹⁵²The argument here, and through this section, leans heavily on Professor Simons' essay, *A Positive Program for Laissez Faire* (1934), which is the most compact of the clear-cut statements of traditional liberal principles and policies available. See also, the same author's *Postwar Economic Policy: Some Traditional Liberal Proposals*, 33 *Am. Econ. Rev.* 431 (1943).

which is always attracted by the high profits of the cartel members, capital equipment is squandered and both producers and consumers suffer.¹⁵³ Where patent, or other governmental, protection is available to keep out competitors, only consumers suffer.¹⁵⁴

The disastrous results of the "do-nothing" policy in government are evident: whereas our ideals are oriented in terms of individualism and the common good, our practice has tended toward industrial collectivism, which is necessarily exploitative in its quest for monopoly profits and impregnability to disturbances elsewhere in the economy. We have made the Hobbesian analysis irrelevant by remaining in a state of nature. Life in this society remains too largely a struggle of naked force against naked force, for recognition and success to accompany performance in accordance with social or civilized standards of excellence. Victory is too often the prize, not of the most excellent, as defined by tenable civilized criteria, but of the most organized and, indeed, the most unscrupulous. The criterion of success has become, not productive efficiency in free and impersonal competition with equals or near equals, but efficiency in the tactics of combination. And while we delegate authority and responsibility to one group of men, we allow other groups, with neither authority nor responsibility, to carry on, in a practically lawless fashion, the most thoroughgoing and intimate regimentation of our lives.

Industrial collectivism tends to inhibit the enterprise and ingenuity which competition fosters, makes possible a regime of administered prices, and interferes with the equal allocation of resources which competition, guided as it is by consumer demand, tends naturally to achieve. Most disastrous of all, because of its inherently exploitative character, industrial collectivism makes detailed governmental regulation necessary in any society whose government is responsive to gross inequities. Now, there are enormous waste and imponderable problems involved in supervision by the government of the details of private enterprise. Experience with railroads and utilities indicates that such regulation is doomed to futility. Evidence introduced at a recent congressional hearing, for example, shows that attempts by the Interstate Commerce Commission to induce railroads to equip themselves with improved safety devices were futile. And in the same hearing testimony was submitted which indicates that rate regulation by the I.C.C. is a chimera:

¹⁵³ Competent economists have long stated that the restrictive practices of combinations in restraint of trade are "self-frustrating devices, which not only destroy productive power, but also destroy the social security which it is their avowed object to ensure." Fisher, *A Liberal New Order*, 10 *Economica* 176 (1943).

¹⁵⁴ Simons, *op. cit. supra*, note 142, at 8-9.

A rate bureau, or . . . rate conference, is a *strictly private* organization of carriers for the purpose of considering and agreeing on rates to be charged. As of the beginning of 1942, there were approximately 60 rate bureaus . . . in the railroad field, and 157 in the motor carrier field. These bureau or conference rates are filed with the Interstate Commerce Commission and with appropriate State commissions. The rates so filed are published by the bureaus and become effective automatically unless proceedings are instituted to suspend and investigate them.

Our studies show that less than 1 per cent of the rates so fixed and filed with the Interstate Commerce Commission are suspended and investigated. . . .

As a mechanical matter I suppose it would be almost impossible to have separate hearings and findings by the Commission on all of those [‘thousands and thousands of different rates’]. . . . It is not done and the rates are filed, and if they are properly filed they become lawful rates.¹⁵⁵

Provoked by the waste and futility of detailed regulation, society’s next step naturally becomes that of ownership and operation by the Government of the means of production. Thus the resentment of private enterprisers and “rugged collectivists” toward any action by the Government may lead to the elimination of all private enterprise. “A retreat from governmental intervention,” says Mr. Leo Cherne, executive secretary of the Research Institute of America, “may prove to be a retreat into full governmental domination, into a completely predigested way of life. There is good reason to fear this outcome. Government has an unavoidable role to perform in a community; it is a reality which cannot be escaped. Denial of that reality by itself multiplies the problems which with each day’s delay, compel more aggressive action by the government.”

Such is the map of the future projected from the standpoint of industrial concentration and collectivism. On the other hand, decentralized, competitive enterprise promises a more attractive future in terms of human freedom and dignity. Permitted to operate within a coherent framework of laws and a stable, or at least intelligible, monetary system, competitive enterprise should equal the productivity of even the most regimented system. And at the same time, because of the self-regulatory character of competition, a competitive enterprise system would safeguard the distinction between political and economic functions, with the concomitant of maximum human freedom in society which that distinction has tended to approximate in the past and promises more fully in the future.

It is no wonder, then, that economic analysts seriously concerned with the preservation of democracy and the strengthening of the free enterprise system, place first on the list of their reforms the prevention or eradication of private monopoly and the deliberate enforcement of competi-

¹⁵⁵ Testimony of Wendell Berge, Part 12 Hearing on S. 702 at 1352-3, 78th Cong., 1st Sess. (1944). Italics added.

tion in the largest area of the economy. "Thus," says Professor Simons, and the emphasis is his, "*the great enemy of democracy is monopoly, in all its forms: gigantic corporations, trade associations and other agencies for price control, trade unions—or, in general, organization and concentration of power within functional groups.*" And again: "The case for a liberal-conservative policy must stand or fall on the first proposal, abolition of private monopoly; for it is the *sine qua non* of any such policy. . . . It implies that every industry should be either effectively competitive or socialized. . . ." ¹⁵⁶

The major ideas in the foregoing analysis may be summarized as follows: (1) The "do-nothing" attitude toward the function of government is a fraud which either wastes the organized power of society or channelizes it into a socially undesirable course. (2) The basic evil in the economy is monopoly power, with its junior exponents, combinations in restraint of trade. (3) Instead of fostering concentration, governmental policy should be directed toward making competition effective wherever possible.

The relevance of this discussion to the subject of patent reform lies in the fact that the case for reform of the patent system is largely the case for rendering competition more effective. Patents are what may be called a matter of pan-industry concern; the effects of the patent system are felt in every area of the economy; it spreads lines across industries and down through industries, from giant firms to pygmies and even to small consumer outlets. Spreading as it does, furthermore, the patent system also serves as a communications line over which the most attractive opportunities for the imposition of industrial hegemony may be relayed. Because it shows the way to really effective and even "legal" combinations, the patent system is a well-nigh irresistible invitation to contracts in restraint of trade, to the satisfaction of the yearning for industrial "coherence," and to the elimination of such bad things as price wars and "unfair competition." Finally, and perhaps most important from a long-run point of view, the patent system operates to make possible and to encourage bigness in "single" concerns, to create one or a few giants in an industry, and thus to place physical, political, and psychological obstacles in the path of any program aimed at promoting competition. For once an industrial giant is created, with its elaborate organization, and its grip on the public mind, cemented by public relations departments rivaling those of the Army and Navy, the job of inducing competition in that industry be-

¹⁵⁶ Simons, *op. cit. supra*, note 152, at 4.

comes enormous. If we are seriously to pursue a program of making competition more effective, therefore, it is clear that something must be done with the patent system.

V

Perhaps the most convincing evidence of the patent system's general inadequacy is that everyone acquainted with it has complained about some aspect of its operation, and all sorts of proposals for reform have been submitted over the years.

Independent inventors, including some of the most noted in our history, have registered formal objection to the inequality of bargaining power encouraged by our do-nothing system which has been, in the long run, a "system" for promoting concentrations of power and inhibition of social utilization of technological improvements. As long ago as 1912, Thomas Alva Edison testified at a congressional hearing that "the long delays and enormous costs incident to the procedure of the courts have been seized upon by capitalists to enable them to acquire inventions for nominal sums."¹⁵⁷ A few years later, the Inventors Guild had this to say:

It is a well known fact that modern trade combinations tend strongly toward constancy of processes and products, and by their very nature are opposed to new processes and new products originated by independent inventors, and hence tend to restrain competition in the development and sale of patents and patent rights; and consequently tend to discourage independent creative thought, to the great detriment of the nation.¹⁵⁸

When it is remembered that the patent system is one of the most important means of creating the "modern trade combinations" of which the Inventors Guild complains, its statement assumes the character of a complaint against the patent system.

More recently, a contemporary inventor has stated in effect that the patent system has choked itself; that the process of acquiring a patent or of exploiting an invention has become simply too much for an individual inventor. "It is hardly to be wondered at," this inventor concluded, in a long letter to the *New York Times*, "that under such conditions an inventor is likely to think three or four times before going to the expense and trouble of applying for a patent here."¹⁵⁹

¹⁵⁷ The Oldfield Hearings of 1912. Quoted in Vaughan, *Economics of Our Patent System* 72 (1925).

¹⁵⁸ Quoted in Vaughan, *Suppression and Non-working of Patents*, 9 *Am. Econ. Rev.* 693 (1919).

¹⁵⁹ Ivor B. Yassin, who had in 1937 invented a structure analogous to the presently publicized Bailey Bridge, was the writer. *New York Times*, p. 14, col. 6 (Nov. 17, 1944).

Despite such objections, however, most complainants contend that there is nothing radically wrong with the basic conception of a patent system; and procedural changes are usually all they propose. Before the T.N.E.C., for example, Mr. Charles B. Sawyer, president of the Brush Beryllium Co., pointed up what seems to be an extensive and irremediable defect of any patent system. He contended that too often patent applicants gain protection in areas so broad that fellow workers in the same or related fields are obliged to subordinate themselves unduly to the first patentee. The first patentee, he complained, often acquires a controlling power out of all proportion to the character of his contribution.¹⁶⁰ And yet, Mr. Sawyer saw no reason for any radical change in the patent system. The most desirable cure, to his mind, lay simply in increasing the staff of the Patent Office. It should be added here that Mr. Sawyer readily confessed that he had not thought much about the problems of patent agreements in restraint of trade, of monopoly, or of cartelization. Pressed on the matter of international agreements dividing territories, he said: "That is a subject on which I am sorry that I am not prepared to speak." But though his business was endangered by the cartel agreement between Siemens & Halske and the American Beryllium Company, Mr. Sawyer thought cartels "not necessarily bad."¹⁶¹

PROPOSALS OF THE NATIONAL PATENT PLANNING COMMISSION

Arising from a similar approval of the basic conception of the patent system are the reforms proposed by the National Patent Planning Commission, an organization composed of several well known technologists and business executives, headed by Dr. Charles F. Kettering, vice-president of General Motors Corporation. The N.P.P.C., which stated in its first report that the patent system "has accomplished all that the framers of the Constitution intended," put forth only two proposals even faintly resembling reforms: proposals for a uniform *objective* test of patentability and a single court of patent appeals.¹⁶²

The proposal for an "objective" test of patentability arises from the perpetual difficulty of deciding when an invention has been made and whether it merits patent protection. This difficulty is currently manifested in the dispute between the "flash of genius" criterion of invention and patentability, on the one hand, and the "measurable" or "objective" cri-

¹⁶⁰ 5 T.N.E.C. 2140.

¹⁶¹ *Ibid.*, at 2142.

¹⁶² Report of the National Patent Planning Commission (1943). This report may be found in Appendix 20 of Barnett, *Patent Property and the Anti-monopoly Laws* (1943).

terion, on the other.¹⁶³ The first of these approaches would restrict the award of patents to cases in which the judge (or patent examiner) thought the contribution offered was the product of a creative leap of the imagination; the latter would allow the grant of a patent in those cases in which judge or examiner thought the applicant had created something new, something which represented a "measurable" advance over the former state of the art. Except for the fact that the dispute over the two criteria has caused a good deal of solemn argument, one might be inclined to dismiss it as absurd. For the crucial variable in deciding patentability is not the verbal test, but the attitude of the judge toward invention—whether he is "easy" toward applicants or enamored of gadgetry, or whether he is "tough" or aware of the restrictive possibilities of patents. Whether the "flash" test or the "objective" test is used actually would seem to make little difference; both are merely similar ways of saying the same vague thing, viz., that the judge or examiner has the duty of examining various devices with the object of deciding whether the applicant is to get a patent. Though the objective test will serve one purpose, which will be dealt with presently, it seems to offer little in the way of reform of the patent system.

The second proposal of the N.P.P.C. is that of a single court of patent appeals. Besides the fact that not even all the admirers of the patent system can agree to this proposal,¹⁶⁴ it seems sterile on other grounds. The ordinary judge does, of course, have to work pretty hard to understand the problems posed by the patent system. Other things remaining equal, time might be saved, therefore, if a specially trained body were given exclusive jurisdiction over awarding patents and determining their technological scope. But other things do not remain equal. The problems posed by patent litigation are not exclusively or even predominantly scientific, technical, or technological problems. In some suits, indeed, these problems may even be relatively unimportant. Issues of priority, anticipation, and rough psychology usually predominate; strictly legal problems such as validity and scope of assignments and weight and admissibility of evidence are common elements. This is largely true, also, of interference proceedings and of the court procedures when appeals are taken by patent applicants from unfavorable decisions of the Patent Office.

The basic problems in patent litigation on this level are whether a pat-

¹⁶³ See Richard, *Standards of Invention in the Patent Office*, 27 J.P.O.S. 24 (Jan., 1945).

¹⁶⁴ For a strongly stated argument, by an admirer of the patent system, against his proposal, see the article by the Honorable John J. Parker, Senior Circuit Judge of the Fourth Circuit, *Recurrence to Fundamentals*, 27 J.P.O.S. 12, 21-3 (Jan., 1945).

ent should be granted and who should get it. Understanding of the technological facts is not impossible, but only difficult, for common-law judges, and no more difficult than understanding of legal doctrine is for technologically trained men. The effective difference between special and ordinary courts blurs still more when one considers that not even technologically trained men can be familiar with all the technological problems raised in patent litigation. By definition, "new" things are involved in such cases. Merely to substitute specially trained men of one group for those of another, therefore, would probably not settle the patent problems created even on this level. At bottom a value judgment is involved. The question is whether the device offered is new and useful. Good judgment is the basic desideratum in such a case, and no one has argued that technologists have a monopoly on good judgment.

The proposal for a single court of patent appeals does promise, however, more consistency in decisions and perhaps more speed in the determination of disputes. As such, it would be desirable, if speed and consistency were ends in themselves. But it seems unprofitable to commend proposals which overlook, as those of the N.P.P.C. do, the abiding difficulties in any attempt to grant exclusive rights in inventions. The point has been emphasized here that the patent system attempts too much. Viewing invention in an essentially artificial light, the patent system has set itself impossible tasks, and it is from the inevitable frustration inherent in any attempt to do the impossible that the glaring evils of the patent system result. These evils the proposals of the N.P.P.C. make no attempt to minimize or combat.

The basic flaw in any patent system results from its attempt to establish a closed category in a dynamic, multidimensional continuum—to carve out an area of *thought* and give it to one individual. It is this fact about invention which, more clearly than any other, distinguishes the so-called property in patents from other, more perceptible and definable, property rights. Again, it is this fact which makes widespread conflict inevitable; for individuals must inevitably wander into the same area of thought. And when they do, the patent system commands them to fight, for the game is winner take all.

This basic deficiency of any patent system has long been recognized, as is to be seen by its treatment in the interesting address given before the Glasgow Chamber of Commerce, in the 1860's, by one J. Stirling. (The address is reprinted here in an appendix.¹⁶⁵) Undiscriminating advocates

¹⁶⁵ The only other place that Mr. Stirling's address can be found, to my knowledge, is in the volume entitled, *Recent Discussions on the Abolition of Patents for Inventions* 116 (London: Longmans, Green, Reader, & Dyer, 1869).

of the patent system still bear down hard on the argument that a patent is like a man's house; they imply that to give up patent protection would border upon physical expropriation.¹⁶⁶ Some of Mr. Stirling's observations should be sufficient to silence those arguments:

Patent-right cannot be defended on the ground of justice.

The object of a Patent-Law is to establish a "property in ideas;" but this involves the double fallacy that thought can and should be appropriated. The end of all law is to ensure the universal freedom of human action. Hence the law of property secures to every man the product of his own labour. It gives to each an exclusive right to the material embodiment of his productive energy, to be possessed or alienated by him at will. But in so doing it leaves unrestricted the productive energy of every other man. The freedom of one (as represented by his property) is thus consistent with the freedom of all.

But thought cannot be appropriated. In thought there is no material product to be made the object of a proprietary right. There is no "thing" to be possessed or alienated. The law can only, therefore, give the exclusive use of an idea to one person by injuriously limiting the intellectual activity of all others. A Patent-right, therefore, is less a "property in ideas" than a monopoly of thought.

The important consideration at this point is that it is impossible to define any invention without, as Mr. Stirling pointed out, slicing into the continuum of thought. If thought be regarded as an undefined area, it is clear that individuals must wander and have wandered into the same region, unaware that through the offices of the patent system it has been pre-empted. It is not possible to put up signposts in this continuum, warning off trespassers. And even if it were, it would seem undesirable to do so. Nevertheless, the patent system has made the attempt, and its only ascertainable product has been tremendous conflict, which only the strongest, not in productive or inventive excellence, but in financial and attendant resources, can survive. The end result is an economy strung with monopolies and cartels.

The things which the N.P.P.C. proposals will not or cannot do having been pointed out, it remains now to consider what those proposals will do. Both proposals would accomplish one thing at least: they would erase the influence on the patent system of the United States Court of Appeals for Washington, D.C. That court now shares jurisdiction with the Court of Customs and Patent Appeals over appeals taken by disappointed patent applicants from adverse decisions in the Patent Office; in such cases, that court has adopted a criterion of patentability which differs, as much as such criteria can, from the "objective" test proposed by the N.P.P.C.

In decisions which have called down the wrath of the patent bar, the

¹⁶⁶ Every conceivable argument in support of the patent system can be found in either the text or the appendices of Barnett, *Patent Property and the Anti-monopoly Laws* (1943).

Washington, D.C., Court of Appeals has attempted to bring the patent system into accord with the Constitutional terms upon which it is based.¹⁶⁷ The court has taken judicial notice of the facts of industrial life, and doing so has found that in the modern industrial laboratory a "complete invention" by a single inventor (a) seldom occurs, and (b) would indeed be inconsistent with the processes of research and development perfected in those laboratories. There can be little doubt that these findings are valid. Besides the evidence cited by the court,¹⁶⁸ the statements of an experienced industrial researcher are enlightening on the point. In a book addressed to industrial research managers, Mr. F. Russell Bichowsky instructs his readers on the relationship of industrial research to the patent system. "There is a delightful legal fiction," he says, "that conception of an idea is a single act to which a date can be put, and *proven*, but in reality, ideas sort of creep up on one. However, if a patent is to be obtained and protected, one must furnish the patent attorney with a written record, signed, witnessed by others and explained to others, stating that A on the date B invented C. It takes both humor and experience to appreciate the absurdities and trouble this simple sounding requirement can cause." Mr. Bichowsky then says: "Usually there really isn't an inventor. A conception of idea usually requires the copulation of at least two minds. Who in this case is the inventor?"¹⁶⁹

The Washington court has also noted that patents offer little or no incentive to employees of industrial research laboratories, because a common custom of those laboratories is to require assignment of all patents obtained by their employees. And particular recognition of a single employee is avoided, moreover, because of the possible harm to the morale of his co-workers.¹⁷⁰ Again, statements made by Mr. Bichowsky are relevant:

. . . it is promotions and special awards which wreck laboratories.

The best procedure [for rewarding technological contributions] . . . involves paying to the laboratory, for distribution among the personnel, a lump sum as a bonus in proportion to the wealth created. This is distributed so that all in the laboratory, even secretaries and janitors profit—those most responsible profiting proportionately.¹⁷¹

¹⁶⁷ See, especially, the two *Potts v. Coe* cases, 140 F. 2d 471 (App. D.C., 1944), and 145 F. 2d 27 (App. D.C., 1944).

¹⁶⁸ See 145 F. 2d 27, 28, et seq.

¹⁶⁹ Bichowsky, *Industrial Research* 82-3 (1942). See also, *Profitable Practice in Industrial Research* 87-8 (1932).

¹⁷⁰ See 140 F. 2d 471, 475, et seq.; 145 F. 2d 27, 29, et seq.

¹⁷¹ Bichowsky, *Industrial Research* 116-7 (1942). "Large bonuses for inventions are fatal errors, conducive to jealousy and immediately destructive to teamwork. Practically, in a

The patent system is based on a theory of individual rewards to individual inventors for individual inventions. Placing the facts about invention in the industrial laboratory against this theory, one cannot sensibly say that facts and theory coincide. As Mr. Bichowsky points out, fictions are necessary to give shape to the essential unreality of the situation. A realistic court might justifiably deny a patent, therefore, on any product of the industrial research laboratory. But the Washington court has not gone that far. It has simply placed with the patent applicant the burden of proving that there was an individual inventive advance over the level of the art then existing in the given laboratory.¹⁷²

This approach certainly poses no insuperable obstacles to the mass aggregation of patents by industrial laboratories; it may, indeed, as Mr. Bichowsky's book indicates, merely add another detail in the work of the industrial laboratories; in addition, the Patent Office favors, and contends that it is bound by, the criterion of patentability established by the Court of Customs and Patent Appeals, and that criterion draws no distinction between applicants from an industrial laboratory and all others.¹⁷³ But the Washington court's approach to this and other patent problems is a hazard of sorts to mass production of patents, and as such it tends to minimize their restrictive power.

With the foregoing facts at hand, it is possible to form a fairly adequate judgment of the proposals of the N.P.P.C. Those proposals would not ameliorate the conditions which underlie the present agitation for reform of the patent system: they would not solve the basic difficulty involved in exclusive rewards for inventions; they would not insure the patents of financially weak inventors or businesses; they would not alter the character of the patent system as the builder and protector of monopolies. If anything, the N.P.P.C. proposals would, on the contrary, make it easier for large firms to acquire vast and complex aggregates of patents. This would be the net effect of abolishing the jurisdiction of the United States Court of Appeals of Washington, D.C.

laboratory enjoying true cooperation in its staff, nearly every important development represents the effective contributions of many workers. Unfortunately our patent law requires that the patent application be filed in the name of an individual, or individuals. Yet it is the co-operative actuality rather than the patent technicality which the laboratory management should stress." L. A. Hawkins (Executive Engineer, Research Laboratory, General Electric Company), "Organization and Operating Principles," in *Profitable Practice in Industrial Research* 71 (1932).

¹⁷² *Potts v. Coe*, 145 F. 2d 27, 28 (App. D.C., 1944).

¹⁷³ See Richard, *op. cit. supra*, note 163, at 28, 33-4.

H.R. 97—THE VOORHIS BILL

Though ignored by the N.P.P.C., the long-run tendencies of the patent system emphasized here have stimulated other proposals for reform. H.R. 97, introduced in January, 1945,¹⁷⁴ by Representative Voorhis of California, is the culmination of several bills aimed at modification of the rights of the patentee.

The Voorhis Bill, which seems to be an honest attempt to return the administration of the patent system to the federal government, subordinates patents to the public policy expressed in the antitrust laws. Except for provisions for readier review of scope and validity of patents (secs. 27, 31), the bill is concerned almost exclusively with what is *done* with patents, rather than with how they are issued. Provision is made for filing with the Antitrust Division a complete history of every patent; the division is made a necessary party to every patent conflict. Expressing the pragmatic attitude displayed by Thurman Arnold in the Senate patent hearings of 1942,¹⁷⁵ the bill makes possible a case-by-case development of permissible patent practice, and it insures the dominance of the antitrust approach by its most important section, section 29.

The ingenious character of section 29 of the Voorhis Bill, which provides for compulsory licensing in a qualified sense, may be best understood by considering some of the arguments revolving around the highly disputed issue of compulsory licensing. Recognizing the obstructive potentialities of patents, many analysts have proposed compulsory licensing as a means of preserving whatever there is of good in the patent system while eliminating the bad. In a day when Englishmen did not think that patents should be used to monopolize trade, for example, one writer argued against the then current demands for outright abolition of the patent system by proposing compulsory licensing. "In order to prevent any patent being, under any circumstances, used to secure a monopoly of trade," he said, "everyone should be at liberty to use a patent upon the payment of a reasonable royalty. . . . This arrangement would decrease patent litigation; for the most powerful inducement to infringe patents would be removed, inasmuch as it would be cheaper to pay a reasonable royalty than to infringe."¹⁷⁶

The common argument against compulsory licensing is that as a general prescription it might discourage all inventive effort. No one would

¹⁷⁴ H. R. 97, 79th Cong., 1st Sess. (1945) is proposed as an amendment to the Clayton Act.

¹⁷⁵ See Senate Hearings on S. 2303 at 3279 et seq., 77th Cong., 2d Sess. (1942).

¹⁷⁶ 9 L. J. 752, 754 (1874).

finance the development of an invention, this argument continues, when an outsider could come in after all the work is done, produce the given device, and sell it at a lower price than the patentee because developmental costs would not be included.¹⁷⁷ Speaking as it does of "discouraging invention," this argument seems naïve when one considers the judgment of social scientists who see invention as the inevitable product of the social process.¹⁷⁸ Again, the argument assumes that it is an expensive thing to produce a patentable invention but a trifling process for an imitator to reproduce it. Common opinion, on the contrary, is that the greatest trouble and expense lie in plant adjustment, training of personnel, marketing arrangements, etc. Even to say that abolition of the patent system would discourage invention or put original inventors at a disadvantage, is therefore rash. But to say that compulsory licensing would do these things comes close to being sheer sophistry, or nonsense. For, besides having a head start, the patentee would have the price advantage accruing from the receipt of royalties.

There is one situation, however, in which the common arguments against a general compulsory licensing scheme have some persuasiveness. Since we have allowed gigantic firms to spread their activities to many different fields of production, their financial strength and technological know-how make them potentially devastating competitors for a small firm seeking to exploit a new device or process. One might have thought that the proper thing to do, to meet this danger of pre-natal strangulation, would be to limit the size and simplify the activities of corporations—prime desiderata on many grounds.¹⁷⁹ But, in the absence of such thoroughgoing reform, complete patent protection, assuming there is such a thing, might be desirable in order to give new firms a start.¹⁸⁰

It is in connection with the latter possibility that the ingenious practicality of section 29 of the Voorhis Bill appears. Section 29 establishes no blanket compulsory licensing requirement. Fitting the patent system into the competitive scheme expressed in the antitrust laws, section 29 pro-

¹⁷⁷ Mr. Barnett's book, *Patent Property and the Anti-monopoly Laws* (1943), contains all the arguments resisting change of the patent system.

¹⁷⁸ See Gilfillan, *The Sociology of Invention* (1935); Mumford, *Technics and Civilization* (1934); Vaughan, *Economics of Our Patent System* (1925); Epstein, *Industrial Research: Heroic or Systematic*, 40 Q. J. Econ. 232 (1926); Kahn, *Fundamental Deficiencies of the American Patent Law*, 30 Am. Econ. Rev. 475 (1940); Ogburn and Thomas, *Are Inventions Inevitable?*, 37 Pol. Sci. Q. 83 (1922).

¹⁷⁹ See Simons, *op. cit. supra*, note 152.

¹⁸⁰ While generally in sympathy with some type of compulsory licensing law, Fortune has suggested that the system "ought to contain special safeguards for the protection of the small, rising enterprise." *War and Peace and the Patent System*, 26 Fortune 138 (Aug., 1942).

vides instead that any use of a patent, "*including any failure or refusal to grant licenses thereunder which has the effect of unreasonably limiting the supply of any article in commerce or of unreasonably excluding the supply of any article from commerce is hereby declared to be illegal.*" Similar provision is made for price-fixing, and forfeiture of misused patents is also provided for. Since provision is made in section 28 for filing all transactions relating to patents with the Antitrust Division, and in section 30 for opinions by the Attorney-General with respect to all such transactions, the chances are, at least under the present administration, that the position of new businesses would be sympathetically viewed if they entered into no restrictive agreements.

But this feature, which renders the Voorhis Bill immune to the strongest argument against a general compulsory licensing scheme, simultaneously leaves it open to objections of what seem to be a more important character. For one thing, the bill embodies all the slippery uncertainties with which the Supreme Court has greased the originally vague Sherman Act. Speaking of "unreasonable limitations on supply," and "unreasonable exclusions" of patented devices from markets, the bill seems to be playing an old game with the Supreme Court, which erected the rule of reason to salvage the Sherman Act from the limbo where, perhaps, it should have been consigned in the beginning.

It should be noted, furthermore, that tying the patent law to the anti-trust laws calls upon the Antitrust Division to depart considerably from its purely prosecutorial role; under the Voorhis Bill, the Antitrust Division assumes to a large extent the character of a regulatory commission. Like the I.C.C., F.C.C., F.T.C., or C.A.B., it would be called upon more and more to prejudge business transactions, and to decide in some cases whether new businesses ought to be established. Its duty to render advance judgment on proposed patent uses distorts the "prosecutorial attitude"; an organization which has approved, perhaps recommended, a particular use, is not in the best position to find its faults. The businessman commonly complains that government agencies know too little of the businesses they regulate. It may be that they know too much.

If as a nation we are concerned with pursuing a policy of free competition, the Voorhis Bill has much to recommend it. Providing means whereby many of the restrictive features of the patent system could be eradicated, it would at least pull many of the fangs, even if it did not kill the serpent. In going only so far, however, it might create as many evils as it destroyed. As long as the patent system exists, there must of necessity be disputes over invention, and with the increasingly rapid technological

development which can be expected, the disputes will probably multiply. For this probability the Voorhis Bill offers no remedy except that the Antitrust Division is made a necessary party to all such litigation. Under the bill, patent suits would thus become more complicated than ever; already burdened with a tremendous job, the Antitrust Division would acquire an even greater load; patent-antitrust suits, already full of imponderables, would become more so. The policing job would be immense. The job of figuring out reasonable royalties on a national and pan-industrial scale would be staggering. The Voorhis Bill is no doubt designed to render antitrust policy more effective. A far more practicable way to do that, though less feasible perhaps as a matter of politics, would be to abolish the patent system. Another recent legislative proposal may be studied profitably with this last suggestion in mind.

SENATE 702—THE KILGORE BILL

Senate 702, introduced by Senator Kilgore in February, 1943,¹⁸¹ was a bill concerned directly with the encouragement and stimulation of science and invention. Denounced flatly by some as deplorable evidence of the "collectivism in the air," the Kilgore Bill had two separable purposes: in general to create a coherent program of technological development, and in particular to safeguard the United States as a nation by providing machinery with which its technological know-how might be assessed and utilized in a fruitful and efficient manner during national emergencies. The best way to meet the name-calling is to quote the statement of policy and purposes of the bill, and to sketch the means it proposed:

DECLARATION OF POLICY

Section 1. The Congress hereby recognizes that the full development and application of the Nation's scientific and technical resources are necessary for the effective prosecution of the war and for peacetime progress and prosperity, and that serious impediments thereto consist in—

the unassembled and uncoordinated state of information concerning existing scientific and technical resources;

the lack of an adequate appraisal, and the unplanned and improvident training, development, and use, of scientific and technical personnel, resources, and facilities in relation to the national need;

the consequent delay and ineffectiveness in meeting the urgent scientific and technical problems of the national defense and essential civilian needs;

the trend toward monopolized control of scientific and technical data and other resources with lack of access thereto in the public interest; and

the absence of an effective Federal organization to promote and coordinate, in the national interest, scientific and technical developments.

¹⁸¹ 78th Cong., 1st Sess.

The purposes of this Act accordingly are—

1. to appraise the current use of scientific and technical knowledge, facilities, and personnel, and to develop comprehensive national programs for the maximum use of science and technology in the national interest in periods of peace and war;
2. to mobilize for the prosecution of the war all scientific and technical facilities and personnel;
3. to facilitate after the war the transition of the national economy from the tasks of war to peacetime enterprise;
4. to assemble, coordinate, and develop for use, in the public interest, all scientific and technical data and facilities; to facilitate access to scientific and technical information and literature and to aid and encourage the writing and publication thereof;
5. to promote the full and speedy introduction of the most advanced and effective techniques—for the benefit of agriculture, manufacturing, distribution, transportation, communication, and other phases of productive activity; for economical and efficient Federal, State, and local government; and for the national defense and general welfare;
6. to aid, encourage, and protect the research and enterprise of inventors, scientists, technicians, scientific and educational institutions, research laboratories and Government establishments engaged in scientific and technical work, and to make their resultant discoveries and data more readily available, and without discrimination, to all sections of industry, agriculture, and the public, in order to aid the war effort at the present time and in order to promote full employment and higher standards of living after the war;
7. to discover and develop substitutes for strategic and critical materials, and to promote the most beneficial use of agricultural, mineral, and other natural resources;
8. to promote interest in scientific and technical education, and to provide for all qualified persons the means of scientific and technical training and employment;
9. to provide guidance in scientific and technical matters to the President, the Congress, and all Federal, State, and local government agencies and establishments, and to contribute guidance and, in all proper cases, financial and other assistance to solution of the technical and scientific problems of industry, agriculture, and of any agency or establishment or individual inventor;
10. to promote the maintenance and expansion of free enterprise by making available to smaller businesses the benefits of scientific advancement;
11. to standardize, when in the public interest, scientific and technical designs, practices, and specifications; and
12. to establish a national scientific and technical office to assure maximum cooperation and integration of the facilities and personnel of governmental and private agencies, institutions, and employers for the above purposes, and to coordinate the activity of these facilities and personnel, where necessary, in the national interest.

To accomplish the purposes of the bill, an office of scientific and technical mobilization, with an initial appropriation of \$200,000,000, was to be set up under a single administrator compensated at the rate of \$12,000

per annum. The president was to appoint, besides the administrator, six members of a national scientific and technical board—one representative each for industry, agriculture, labor, and the consuming public, and two members at large “who shall be scientists or technologists”—each to be paid \$10,000 annually. “The Board and its several members,” the bill provided, “shall perform such duties under the direction and control of the Administrator as he may assign to them; they shall have access to all information of the Office relating to the Administration thereof.” Besides this board, the bill provided for a policy-forming committee composed of the board plus additional representatives for technology, management, labor, the consuming public, and such federal departments as the President should designate. This committee, serving without pay, was directed to meet regularly, not less than once a month, “to advise and consult with the Administrator . . . upon the basic policies governing the administration of [the bill].”

In peacetime, the office was to have no power to command personal or other services; its power would extend to taking censuses of science, extending to facilities, requirements, and personnel, and to the formulation and promotion of specific projects, presumably on a free contract basis. In wartime, the office was to have the customary draft powers, restricted, however, to technical and scientific personnel and facilities. War and peace were bridged by the census-taking function and the cumulated experience gained in working on specific projects. It seems unnecessary to discuss the desirability of a continuing coordinating agency, such as the bill proposed, for war purposes. The “scientific” character of modern warfare has its own persuasiveness.

The weakness of the Kilgore Bill, as an attempt to free the nation’s scientific and technological resources in peace as well as in war, is that the institution it proposed had to be accommodated to the patent system. Instead of going the whole way and giving science and technology the completely open field in which they develop most fruitfully, the bill proposed a freedom of science only in the interstices of the patent system. Given the authority to establish research projects, to endow privately conducted research, to serve as a clearinghouse of scientific and technological information, and to carry new technics through the early, difficult phases of development by the erection of pilot plants, the organization proposed in the Kilgore Bill would fill in whatever gaps in research and invention might result from the abolition of the patent system.

The bill operated on the assumption, however, that the patent system is to be maintained. If the bill became law without abolishing the patent

system, the function of the office would be limited and its operation exposed to obstructing conflicts with private organizations seeking patent protection. The office could scarcely expect to serve so effectively as a clearinghouse of technological development as it might in the absence of the patent system. Conducting research with a view to patent protection, private organizations could scarcely be blamed for withholding information; and efforts on the part of the office to secure information would create only friction. Charges of bureaucratic snooping and bungling could be expected in large volume. There is something unlovely, too, in the fact that the office would probably be engaged often in patent disputes. Its work would inevitably intersect that of private organizations, even though the patent system stood between them to draw a dividing line of mutual intolerance, and the consequent disputes would heighten the present insanity of distrust between "business" and "government."

In the absence of the patent system, however, the trend would in all probability be just the other way. Private research organizations, which would continue as necessary elements in any firm faced with the necessity of meeting competition, would find their interests served by an organization such as the Kilgore Bill proposed. The office would provide a reservoir of researches and ideas, open to all, from which individual firms could draw, and upon which they could build. A relationship profitable to both might be established between the universities and the Government. Science might flourish, and an era of competition in excellence ensue.

Having to adjust itself to the patent system was probably responsible, finally, for the lack of clarity in the over-all conception of the bill. Were there no patent system to cope with, the function of the office would be simple in basic character, though comprehensive and challenging in scope. The administrator would be required simply to do the best he could to promote the progress of science and useful arts. Based on the prevailing conception of the inevitability of conflict, however, the bill provided for the stock pressure groups, committees, and boards. And not only would the underpaid administrator have been required to cope with the groups, committees, and boards; the bill further required him to exercise a considerable amount of care in disposing of the patents which he would presumably have had a good deal of trouble in acquiring. Authorizing the administrator to issue nonexclusive licenses on patents he acquired, the bill also called upon him to render a difficult and inappropriate judgment: "No such license," the bill stated, "shall be granted unless the Administrator shall first be satisfied *and shall find that no monopoly, monopolistic practice, or unfair competitive advantage will be promoted thereby.*"

The truth of the matter probably is that the patent system will always cause trouble. Though "general semantics" has been invoked recently to correct some of its absurdities,¹⁸² and though specifics such as the objective test of patentability or the single court of patent appeals may be submitted from time to time to patch up the system, its faults lie too deep for remedy.

Established to promote the arts and sciences, the patent system's most significant effect has been to create conditions which tend to inhibit progress of any kind. The patent system has been hailed as the guardian and protector of the individual inventors when, as a matter of fact, it has helped to create conditions wherein all individualism is becoming more and more difficult. Stoutly defended on the score that it aids in the establishment of new businesses, actually the patent system has operated to frustrate enterprise. People have unblushingly said that the patent system is largely responsible for America's industrial might. As the creator of monopolies and cartels, on the contrary, the patent system may be called, with more respect for fact, a potential hemlock draught for America. Technological progress of a kind has occurred, indeed, while the patent system has been in operation. At the same time, however, monopolies, cartels, and restrictive practices of other types have flourished, to cancel the social good possible in technological advance. The wealth created by the patent system, if any, deserves Carlyle's remark: "It is an enchanted wealth; no man of us can yet touch it." A causal relationship between the patent system and the restrictive practices can be proved. No causal relationship between our self-praised industrial progress and the patent system can be proved, however. The strength of America lies in its physical endowment, its people, and the energy liberated by its air of freedom. To attribute this strength to the patent system is a misrepresentation, based on sheer faith, and useful only to distort immensely important issues.

If we are concerned with promoting scientific and technological progress, and if we are concerned with approximating the conditions of free and competitive enterprise, a simpler and more rigorously conceived version of the Kilgore Bill might help. But a less superstitious eye should be focused on the patent system, that institution which combines the worst features of both sacred cow and white elephant.

The patent system, at least as it is organized at present, should be abolished. There is neither justice in nor necessity for giving monopolies in products emanating, as most inventions do, almost imperceptibly from the social process; especially when the recipient of the monopoly may have

¹⁸² See Kent, *General Semantics and the Patent System*, 27 J.P.O.S. 37 (Jan., 1945).

become entitled to it (legally) only through an unequal bargain with an actual contributor. A stimulus to invention and improvement will exist so long as people have unsatisfied desires, and so long as men are creative animals. If a fear should remain, however, that invention will cease without extra stimulus, alternatives are available. The type of institution proposed in the Kilgore Bill would help inventors directly, and since it would have no compulsory powers it is difficult to see what harm the institution could do (in the absence of a patent system). Cash awards for invention are another alternative. Less desirable because they would entail the difficult problem of valuing inventions, and the hopeless one of defining them, cash awards are nevertheless preferable to the present patent system. They would at least reward inventors directly, without tying up industry as the present patent system does.

APPENDIX

PATENT RIGHT

(A paper by Mr. J. Stirling, Esq., presented to the Glasgow Chamber of Commerce [186?]. Reprinted from the volume, *Abolition of Patents* (London: Longmans, Green, Reader, & Dyer, 1869).)

First: Patent-right cannot be defended on the ground of justice.

The object of a Patent-Law is to establish a "property in ideas": but this involves the double fallacy that thought can and should be appropriated. The end of all law is to ensure the universal freedom of human action. Hence the law of property secures to every man the product of his own labour. It gives to each an exclusive right to the material embodiment of his productive energy, to be possessed or alienated by him at will. But in so doing it leaves unrestricted the productive energy of every other man. The freedom of one (as represented by his property) is thus consistent with the freedom of all.

But thought cannot be appropriated. In thought there is no material product to be made the object of a proprietary right. There is no "thing" to be possessed or alienated. The law can only, therefore, give the exclusive use of an idea to one person by injuriously limiting the intellectual activity of all others. A Patent-right, therefore, is less a "property in ideas" than a monopoly of thought.

Again, a true right of property is universal in its application; it extends to the products of all industry, however humble. But it is instinctively felt, that a proprietary right applied to every individual idea would be essentially absurd. Patent-Law, therefore, is essentially partial in its application. It picks out certain favourite ideas, and confers on them an anomalous and oppressive privilege. There seems no good reason why the ideas of inventors should be especially favoured. An invention is a means to a special end, and should be recompensed by him who has the end in view. If any ideas deserve a public recompense, it is those general ideas whose application is of universal utility. But Patent-Law ignores the discoverer of general ideas, and while conferring rewards, at the expense of the community, on empty schemers and puffing tradesmen, it passes over the services of a Newton or an Adam Smith. The law of Copyright, indeed, gives to the philosopher a right of property in his published and material works, but it leaves (most justly) his ideas to be used and elaborated by whoso can and will.

Again, Patent-Law is founded on a conventional, not a natural, right. It is not, like the ordinary law of property, based on a universal intuition of the human conscience, but it is one of those laws by which unwise legislators have striven so long and so vainly to give an artificial stimulus to human industry. Hence the arbitrary nature of its enactments. The ordinary right of property is unlimited in its duration—passing from generation to generation. But common sense revolts, instinctively, against a perpetual monopoly of thought. A Patent-Law, therefore, can never be more than a weak compromise with principle—the legislator undertaking to secure to the patentee his ideal property during the biblical term of seven or fourteen years. Now, if the inventor have a right at all, he has a right to more than this. To cut down a real and acknowledged right of property to seven, or even fourteen, years were a grievous wrong. Patent-right goes too far, or not far enough. Either a Patent is no right at all, or it is a right for all time. If ill-founded, it is a robbery of the public; if well-founded, of the patentee.

Mere priority affords no good ground for the exclusive right to an invention. The free exercise of thought is the common right of all. Wherefore if A excogitate a principle today, and B, by independent thought, excogitate the same principle tomorrow, both have an equal right to benefit by the discovery; and A has no natural right to debar B from the legitimate fruit of his intellectual effort. It may be even that A has no real priority of thought, but was only more knowing, more greedy, or was simply nearer to a patent office, and, though latest in arriving at the idea, was the first to secure a legal monopoly of its use. To found a right on such a race for priority is evidently irrational. The simultaneousness of discoveries and inventions by different minds, is a well-established fact in the history of science. Certain facts and reasonings, all tending in a given direction, are before the world. These act simultaneously on various minds, and produce in each the same development of thought. Now, with what justice do we pick out one of these many thinkers and give him a monopoly of the common thought? Nor is the injustice confined to the original idea, of which we grant a monopoly. By tying up one idea, we stop the whole course of thought in a given direction, and thus interfere generally, and to an indefinite extent, with the intellectual activity of other men.

The inventor benefits by the ideas of the community, and has, therefore, no right to a special privilege for his idea. The universal thought of mankind is a common good; all benefit by it freely, and all are bound freely to contribute to it. Every thinker owes an incalculable debt to society. The inventor has the benefit of all foregone human thought, of all existing civilization. He has the unbought advantage of all laws, all language, all philosophy. He has the free use of all the methods and appliances, spiritual and material, which have been painfully elaborated by the thinkers and workers of all time. Why, then, should he alone have an exclusive privilege, in respect of the infinitesimal addition which he may make to the work of ages?

Secondly: Patent-right cannot be justified on the lower ground of expediency. The object of a Patent-Law, in the supposed interest of the community, is to stimulate invention. But invention needs no artificial stimulus. Nature has amply provided all needful and wholesome encouragement, in the additional profit afforded by improved methods of production. In the natural course of business, every producer is spurred on by his material interests to invent for himself or to encourage the inventions of others. The whole history of industrial progress is an unceasing striving after improvement, with a view to profit. The few thousand patented inventions are as nothing compared with the innumerable improvements produced daily and hourly in the ordinary course of business, with the vulgar view of gain. The best stimulus to invention, therefore, will be found in the natural competition of producers; but Patent-Law destroys this competition by an unjust monopoly, and thus tends indirectly to weaken the natural impulse to improvement.

Invention may be even over-stimulated. In all her arrangements, Nature provides for a due equilibrium of powers and tendencies. Thus the various faculties and temperaments of man—the sanguine and the cautious, the speculative and the practical—are nicely balanced. The result, when things are left to themselves, is a happy combination of ingenuity and caution, and, as a consequence, a continuous but prudent course of improvement. But if, by conventional rewards, we give a factitious impulse to the inventive faculty, we destroy the natural equilibrium of capacities, and foster a scheming, fanciful turn of mind, at the expense of thoroughness and a patient working out of

sound ideas. This result has actually occurred in the United States, where the factitious value attached to invention has tended to produce an almost total sacrifice of solid workmanship to a flimsy ingenuity.

Patent-Law does not even attain its proposed end of quickening the progress of real improvement; on the contrary, it is found in practice seriously to hinder it, the monopoly granted to one inventor necessarily obstructing the progress of every other. Hence, an eminent inventor has lately said: "The advance of practical science is now grievously obstructed by those very laws which were intended to encourage its progress." That Patents seriously obstruct the natural development of ideas, is best seen by the sudden advance which usually follows the expiry of important Patent-rights. The natural course of improvement, dammed back by artificial obstruction during the continuance of the Patent, is set free on its conclusion, and a new impulse is given to the development of ideas and their practical application.

But the public is not the only sufferer by Patent-right. Without doubt the heaviest evil falls on the patentee. The inventor is led to give an excessive development to his talent, and is seduced into reliance on a law that can give him no substantial protection. The difficulty of defining original inventions is a practical bar to a satisfactory Patent-Law. The whole history of Patents is a long-continued story of litigation and disappointment; and the more admirable the invention, the greater is the certainty of difficulty and loss. It must be a worthless invention that the patentee is left to enjoy in peace. Whenever a Patent is worth pirating, the inventor may depend on being involved in a maze of litigation that disturbs his peace and ruins his fortunes. And the more the Patent privilege is extended, the worse the evil becomes; the intricacy and their multiplicity of details baffling every attempt to define the rights of competing inventors.

At this moment the heaviest complaints against Patents come from our great inventors. They repudiate the proffered privilege as "injurious to inventors," and complain of being "borne down by an excess of protection." As is natural, they who are most occupied with the advancement of invention, feel most acutely the grievous obstructiveness of the Patent-Law. Not enough that they have to battle with natural difficulties; at every step they meet obstructions which a well-meaning but perverse law places in their way. Nor do these obstructive privileges confer any real advantage on the empty schemers whose monopoly they establish: they merely give them the vexatious power of hindering the progress of better men. The mere "pen-and-ink inventor" has neither the energy, nor the perseverance, nor the practical ability to mature his crude "ideas"; but to this man the law awards the dog-in-the-manger privilege of effectually obstructing the natural progress of practical improvement.

These practical evils the advocates of Patent-Law do not deny; but they attribute them to the defective execution of the law, not to its vicious principle. Hence a never-ending cry as in the case of all bad laws, for more legislation, for more stringent regulation, for stricter investigation, and more thorough registration of Patents. But no tinkering at details can avail. The whole system is radically unsound; and the only effectual remedy is to lay the axe to the root.

A sentimental plea in favour of Patent-right has been set up by some, on the ground that the inventor—the man of thought, as he is called—must be saved from the toils of the capitalist, ever ready to prey on his superior intellect. This silly sentimentalism could only originate in an utter ignorance of the relations which naturally subsist be-

tween capital and talent. The capitalist is the natural ally of the inventor, whom it is his interest to employ and encourage. It is a chief part of the business of every producer to search out every one who can help him to improved methods of production; and the remuneration which, in one shape or another, it is the interest of the capitalist to offer to the really clever inventor, will always form a surer and more substantial reward than the delusive privilege of a legal monopoly. As to the complaints we hear of neglected talent, we may safely conclude that they arise more from the exaggerated pretensions of conceited schemers, than from any obtuseness to their own interests on the part of practical men of business, who refuse to profit by their inventions.

On the whole, Patent-Law seems a blunder, founded on the antiquated notion of giving State encouragement to certain favoured modes of human activity. It is no part of the duty of the State to stimulate or reward invention; the true function of Government is to protect, not to direct, the exercise of human energy. By securing perfect freedom to each individual, we shall best provide for the progress of the community; nor can any law be conceived more detrimental to the common weal than one which lays restrictions on perfect freedom of thought.