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I. INTRODUCTION

> The only easy way to tell how good a patent is, is to look at it 25 years later. [Chester Carlson's] is probably the best one I have ever seen – maybe the best patent ever written in the U.S.[1]

So wrote Frank Steinhilper, who founded the patent law department at Haloid, the company now known as the Xerox Corporation. It would have been extravagant praise for any legal document. It seems especially so for Carlson's basic claims to techniques for making copies by exploiting a link between light and static electricity, because they never faced a serious challenge.[2] Astonishing as it seems in hindsight, Carlson in 1938 was all by himself in the hunt for a machine that would make plain paper duplicates of a previously created document. Even more than two decades later in 1959, as Xerox prepared at last to introduce its Model 914 copier, the first machine that truly fulfilled Carlson's Depression era vision, the consensus among major corporations and marketing consultants who considered its prospects was that hardly anybody would buy it.[3] Carlson thus deserves double laurels for his inventive genius, first for seeing that it could be done, but second, and perhaps more re-

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1. ERIK M. PELL, FROM DREAM TO RICHES 60 (1998).
2. *See id.* (describing Carlson's imaging techniques).
3. *See* SOL M. LINOWITZ, THE MAKING OF A PUBLIC MAN 80 (1985).

markably, for seeing that it was worth doing. His basic patents, however well wrought they may or may not have been, expired without ever having to fend off a competing claim in court.

Nevertheless, Carlson's insight into the significance of patents may have been as impressive as his achievements as an inventor. His undergraduate education was in physics, and his first employment was as a research engineer at Bell Telephone Laboratories in 1930.[4] But he moved very quickly into patent work, first with Bell and then with P.R. Mallory & Co., a New York electronics firm.[5] In 1936, he enrolled in evening courses at New York Law School to obtain formal credentials as a patent attorney.[6] Somehow in the midst of his draining double load of professional duties at Mallory and night school class assignments, Carlson found time not only to conceive and demonstrate the technology that would eventually transform office life the world over, but also to begin seeking a patent for it.[7]

Carlson had an almost obsessive sense of every inventor's practical dependence on patent protection. As work went forward in the 1950s on the scores of patentable improvements that his basic process needed before it could become the 914, Carlson became known among his Haloid colleagues as a relentless evangelist and sometimes a nag on the subject.[8] Yet, in his character and behavior after Xerox burgeoned almost overnight into a powerful supercompany, there was visible a deeper and more generous appreciation of the philosophical and moral foundations on which patent law rests.

A patent, after all, is not an entitlement but a contract.[9] Patent law was not created to recognize an ownership right in the inventor.[10] On the

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4. *See* ALFRED DINSDALE, XEROX CORP., CHESTER F. CARLSON: INVENTOR OF XEROGRAPHY (1963).

5. *See Chester Carlson,* Personal History of Chester Carlson (on file with the New York Law School Law Review).

6. *See* New York Law School transcript for Chester F. Carlson (on file with the New York Law School Law Review).

7. *See* Dean J. Golembeski, *Struggling to Become an Inventor,* AMERICAN HERITAGE OF INVENTION AND TECHNOLOGY, Winter 1989, at 8, 13.

8. *See* Interview by Catherine Carlson, daughter of the inventor, with Sol Linowitz, former Chairman of the Board of Xerox Corp., Rochester, N.Y. (May 18, 1999) (transcript on file with New York Law School Law Review).

9. *See* ERNEST BAINBRIDGE LIPSCOMB III, LIPSCOMB'S WALKER ON PATENTS 7-9 (3d ed. 1984).

10. *See id.*

contrary, its fundamental assumption is that the fruits of mankind's inventive genius are part of the communal wealth; a patent aims only to assure the inventor just compensation.[11] Carlson seems to have grasped this instinctively, even before he had formal legal training. His dream from an early age was to invent something that would not only bring him financial security but also make a significant contribution to humanity.[12] And even without legal education, his deep, natural humility[13] and his subsequent experience with electronic copying would have given him ample opportunity to acquire as keen a sense of his debt to others as of what he himself had contributed.

Carlson tried vainly on his own to sell rights to his invention in the crude and barely demonstrable form in which it came out of his Queens, New York, workshop.[14] Frustrated after five years of "enthusiastic lack of interest"[15] from prospect after prospect, he teamed up in 1944 with the Battelle Memorial Institute, an Ohio research organization, to develop his process into something more marketable.[16] Battelle made some progress, but horizons for Carlson's invention seemed limited at best until 1946, when Battelle made a deal with Haloid to share the work and the patent rights.[17] Haloid, then a small graphic arts company in Rochester, New York, was desperate for new products, and hired Carlson in 1948 as a full-time consultant.[18] In the years that followed, Carlson was able to observe firsthand the elaborate skein of corporate alliance, market appetite, engineering teamwork, further invention, dogged determination, faith, and amazing luck that it took to bring his work successfully to market. After the 914 made him a rich man, he gave away a substantial

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11. *See id.*

12. *See* Catherine Carlson, Address at the dedication of the Carlson Center for Imaging Science, Rochester Institute of Technology (Oct. 22, 1998) (transcript on file with the New York Law School Law Review).

13. *See* Pat Dougherty, *Chester Carlson, Self-Effacing Genius*, reprinted in Wolfe Newspapers – 25 Years – Unforgettable Personalities 1957-1982.

14. *See Concentration, Invention, and Innovation: Hearings before the Subcommittee on Antitrust and Monopoly of the Committee on the Judiciary United States Senate*, 89th Long. 1109 (1965) (statement of Daniel V. DeSimone, Director, Office of Invention and Innovation, National Bureau of Standards, U.S. Department of Commerce).

15. *Id.* at 1110.

16. *See id.*

17. *See* PELL, *supra* note 1, at 30.

18. *See* Carlson, *supra* note 5, at 5.

portion of the wealth.[19] He once told his wife, Dorris, that he hoped "to die a poor man."[20] She said years after his death he had tried hard to make good on that hope.[21] Her testimony provides convincing evidence that Carlson, however fiercely he guarded his legal rights, considered himself as much beneficiary as benefactor of those whose lives he and his creation touched.

Far more telling in every respect, however, is Carlson's treatment of Otto Kornei, the Austrian refugee engineer he hired in 1938 to produce a model to demonstrate the copying process he had discovered.[22] Carlson engaged Kornei under a meticulously worded letter agreement that reserved to himself all rights not only to his own inventions, but also to anything Kornei created.[23] In exchange, Carlson paid Kornei a modest salary and promised him ten percent of Carlson's profit from any invention patented while the two were working together.[24] A year later, Kornei, by now in Cleveland and launched on his own engineering career, agreed to release Carlson from their deal.[25] It was a decision he came bitterly to regret two decades later when the Xerox 914 took the business world by storm.[26] Kornei's own career, though successful, had not blossomed as he had hoped, and his son was about to enter college.[27] Stricken at the thought of the fortune he might have shared, he wrote Carlson a fractious letter protesting the injustice he felt had been done to him.[28] Carlson responded with a methodical explanation of the fair treatment he insisted Kornei had received.[29] Then he signed over 500 shares of Xerox stock to his old friend and collaborator, a small fortune roughly equal to

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19. *See* Catherine Carlson, *supra* note 8, at 1.

20. *See* Dorris Carlson, Address at the dedication of Genesee Hospital (May 4, 1975) (transcript on file with the New York Law School Law Review).

21. *See id.*

22. *See* Carlson, *supra* note 5.

23. *See* Letter from Chester Carlson to Otto Kornei (Oct. 6, 1938) (on file with the New York Public Library Special Collections).

24. *See id.*

25. *See* Letter from Otto Kornei to Chester Carlson (July 25, 1939) (on file with the New York Public Library Special Collections).

26. *See* Letter from Otto Kornei to Chester Carlson (June 7, 1960) (on file with the New York Public Library Special Collections).

27. *See id.*

28. *See id.*

29. *See* Letter from Chester Carlson to Otto Kornei (June 18, 1960) (on file with the New York Public Library Special Collections).

what Kornei would have taken under the terms of the 1938 contract he had voluntarily revoked.[30]

The Kornei story is an illuminating parable. The law sometimes seems to have all it can to demarcate the forms of rights and duties. Apprehension of the substance is left, often as not, to the individual conscience. This article contends that in Carlson's stewardship of his creation and the good fortune it brought him, both form and substance appear to have been in reliable hands.

II. HISTORICAL PERSPECTIVE: EVOLUTION OF PATENT RIGHTS

> The works of founders of States, lawgivers, tyrant-destroyers, and heroes cover but narrow spaces, and endure but for a time; while the work of the inventor, though of less pomp, is felt everywhere and lasts forever.[31]

So wrote Francis Bacon in the preface to his Treatise on Interpreting Nature, simultaneously paying homage to inventors and stating the case for the covenant that sovereigns have made with innovators for centuries. English patents, of course, were not originally confined to rights of inventors.[32] They were simply open letters from the sovereign in which the grant of an exclusive franchise or privilege was announced.[33] Some conferred special rights in commerce on individuals, merchants, or trade and craft guilds.[34] Others permitted the import of certain commodities or goods. Still others related to the manufacture of new devices.[35] The system eventually became corrupt and abusive as royal patent holders turned virtually all commercial activity into monopolies, usually obscenely profitable and often imposed on a resentful marketplace by

30. *See* Letter from Chester Carlson to Otto Kornei (Sept. 15, 1960) (on file with the Carlson Papers, Box 18, New York Public Library Special Collections).

31. *See* LIPSCOMB, *supra* note 9, at 47 (quoting Sir Frances Bacon).

32. *See id.* at 1-9.

33. *See id.*

34. *See id.*

35. *See id.*

thugs.[36] But patents at the outset had a benign purpose to provide protection and incentive for enterprises that would help build the fledgling British economy.[37] Their foundational principle was that all wealth-producing rights and privileges came into being as the sovereign's, thereafter to be granted or withheld at royal discretion.[38]

The rise of capitalism invited an opposing view, or at least presented ideas that could erode the popular understanding of the origins of patents in sovereign prerogative. In capitalist economic theory, the real "sovereign" is the aggregated "invisible hand" that springs from the self-interested behavior of all economic actors.[39] Individual enterprise is the engine of wealth creation. "I have never known much good done by those who affected to trade for the public good," wrote Adam Smith in *The Wealth of Nations*.[40] More succinctly, greed is good. In such an ethical context, it is not hard to see how an inventor's patent could come to be regarded not as a temporary partition of universal sovereign entitlement but rather as the recognition and protection of a property right that originates in the enterprising inventor and belongs to him alone until the law requires him to share it.

On its face, the Constitution takes no philosophical view one way or the other. The Framers appear to have been content to rest U.S. patent law on a pragmatic foundation. Congress is empowered to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries[.]"[41] The beholder can decide for himself whether the purpose of the law, after providing incentive and compensation to the inventor, is to restore inventions to their rightful place amid the common wealth or simply to assure efficient operation of the marketplace. Adam Smith, after all, disapproved of trade secrets and monopolies just as decisively as he dismissed the "public good."[42]

U.S. presidents have lauded the nation's patent system for its salu-

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36. *See id.* at 9.

37. *See id.* at 1-9.

38. *See id.*

39. *See* Peter Landry, *Adam Smith*, *at* http://www.blupete.com/Literature/Biographies/Philosophy/Smith.htm.

40. *See* 1 ADAM SMITH, THE WEALTH OF NATIONS 400 (Dutton 1964) (1776) (visited June 21, 2000), *available at* http://www.blackmask. com/olbooks2/welnat.htm.

41. U.S. CONST. art I, § 8, cl. 8.

42. *See* Landry, *supra* note 39.

tary fruits, rather than its ethical roots, whatever they may have thought the latter to be. "Nobody wishes more than I do that ingenuity should receive liberal encouragement,"[43] wrote Thomas Jefferson, whose own renowned ingenuity seemed not to need much encouragement at all. Abraham Lincoln, in characteristic epigrammatic style, wrote that "The Patent System added the fuel of interest to the fire of genius."[44] Franklin Roosevelt struck a slightly higher-minded but still results-oriented note when he said that the system "has promoted countless applications of the arts and sciences to the needs and well-being of our people."[45]

The practical benefits of encouraging inventive initiative extend beyond the inventor himself. An investor who supports his research or helps bring his invention to the market also requires incentive and security.[46] So do the collaborators or competitors whose improvements may be essential to the creation of the best product.[47] Deference to the explicit public purpose behind a sound patent system is clearly discernible here. "Systematic improvement, first by one and then by another, in a sort of zig-zag fashion, is perpetuated through engineering, patenting of inventions and competition between producers. All three factors must be present if the public is to benefit to the maximum degree."[48]

Carlson was a careful student of patent law, never more so than when it came to bear on him and his work. In later years, he lobbied for changes that would give inventors more than the statutory seventeen years to recoup their investments of time and money before the doors are opened to competitors.[49] He pushed constantly at Xerox for more patent attorneys and closer attention to the many patentable inventions being created in the company's research laboratories and workshops.[50] Carlson himself accounted for at least thirty-nine of them.[51] Whatever the origins

43. *See* LIPSCOMB, *supra* note 9, at 58 (quoting Thomas Jefferson).

44. *Id.* (quoting Abraham Lincoln).

45. *Id.* (quoting Franklin Roosevelt).

46. *See id.* at 64.

47. *See id.* at 55.

48. *Id.* at 55 (quoting Charles E. Lucke, head of Mechanical Engineering Department at Columbia University).

49. *See* Letter from Chester Carlson to Daniel Reed, chairman of the U.S. House Ways and Means Committee (Feb. 15, 1954) (on file with the New York Public Library Special Collections).

50. *See* LINOWITZ, *supra* note 3, at 64.

51. *See* List of U.S. patents issued in Chester Carlson's name (on file with the New York Law School Law Review).

of patent rights, he clearly knew what his rights were and how to guard them. But an examination of his personality and background reveal just as clearly a man who understood that invention is in many ways a communal endeavor in the service of the common good.

III. THE DEVELOPMENT OF CHESTER CARLSON, INVENTOR

An inventor is never truly independent. His endeavor rests upon a foundation of knowledge accumulated by others, and his purpose is shaped by the needs and appetites he seeks to satisfy. Carlson understood this. "Things don't come to mind readily all of a sudden, like pulling things out of the air," he once wrote. "You have to get your inspiration from somewhere and usually you get it from reading something else."[52] Even the name of his invention, "xerography," was not his own but was coined by an Ohio State University language professor who cobbled it together from the Greek words for "dry" and "writing."[53] Yet Carlson's personality and background made him a loner from childhood,[54] and he remained shy and tentative in his dealings with others throughout his life.[55]

Carlson was born in Seattle on February 8, 1906,[56] by intriguing coincidence the same year Haloid was founded.[57] His father, Olof Adolph Carlson, was an itinerant barber in extremely poor health.[58] When Carlson was still a toddler, the family was forced to move south in search of a drier climate for the elder Carlson's tuberculosis,[59] even venturing into Mexico to share an adobe shack with tarantulas and scorpions until that country's revolution forced them back across the border.[60] They finally

52. *See* Dinsdale, *supra* note 4, at 9.

53. *See* PELL, *supra* note 1, at 36.

54. *See* Carlson, *supra* note 20, at 7.

55. *See* Dougherty, *supra* note 13, at 8.

56. *See* Carlson, *supra* note 5, at 1.

57. *See* Xerox Corporation, *The Story of Xerography 7*, Xerox publication #610 P 20491.

58. *See* Dougherty, *supra* note 13, at 8.

59. *See id.*

60. *See* Carlson, *supra* note 20, at 6.

settled in a poor section of San Bernadino, California.[61] Along the way, Carlson's father also contracted spinal arthritis.[62] Olof Carlson was, as his son later recollected, "a bent, emaciated wreck of a man who was to spend the greater part of each day for the next twenty-six years laying flat on his back, wracked by coughing spells and defeated by the world."[63] The arthritis turned out to be an inherited affliction; among the inventor's trials as he sought a market for his newly discovered copying technique was the struggle to keep chronic pain from blighting his life as it had his father's.[64]

Carlson became aware at an early age that "he was different from other children," his wife Dorris recalled.[65] "He felt like an outsider."[66] Non-competitive by nature, Carlson avoided sports and games,[67] but he would have had little time for them in any event. He went to work at age nine selling soda water.[68] By the time he was twelve years old he was helping to support the family,[69] rising before dawn to earn money washing windows or sweeping floors until it was time for school, then hurrying from classes to do more odd jobs in the afternoons.[70] Throughout his school years, he pulled weeds, harvested potatoes, picked fruit, sold fish, worked as a janitor for a succession of small businesses, and did whatever else he could to help him and his mother keep their heads above water.[71] She died of tuberculosis when he was seventeen.[72] Years later, the disease claimed his father's life too.[73]

Carlson's part-time labors financed his college degree as well, though they also delayed it.[74] He enrolled in a work/study program at

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61. *See* Golembeski, *supra* note 7, at 8.

62. *See* Dinsdale, *supra* note 4, at 5.

63. *Id.*

64. *See* Carlson, *supra* note 12, at 3.

65. *See* Carlson, *supra* note 20, at 7.

66. *Id.*

67. *See id.* at 8.

68. *See* Carlson, *supra* note 5, at 1.

69. *See* Dougherty, *supra* note 13, at 8.

70. *See* Interview by Joseph J. Ermenc with Chester Carlson, New York, N.Y. (Dec. 16, 1965) (Transcript on file with the New York Law School Law Review).

71. *See* Carlson, *supra* note 5, at 1.

72. *See Hearings, supra* note 14 at 1108 (statement of Daniel V. DeSimone).

73. *See id.*

74. *See* Ermenc, *supra* note 70, at 6.

Riverside Junior College where a two-year degree would take four years to complete. [75] Carlson managed to complete it in three.[76] He received his bachelor's degree in physics from the California Institute of Technology in 1930, six years after graduating from high school.[77] He found work at Bell Laboratories as a research engineer, but considered it "a blind alley" and switched to the Bell patent department in hopes of greater contact with inventions.[78] He liked that position better, but it disappeared in 1933 when the Depression forced cutbacks at Bell.[79] Carlson found himself in New York a year later in the P.R. Mallory patent office.[80] The job involved close inspection of retyped patent documents and redrawn diagrams, and he was soon asking himself if there could be a better way to make copies.[81]

Carlson reflected later that the poverty and isolation of his upbringing shaped his character, which in turn was reflected in his later work habits.[82] He labored alone over the birth of xerography, first in the New York Public Library reading room,[83] then in the kitchen of his Queens apartment, until the sulphurous smells from his experiments forced him to rent a back room above a bar and grill in the borough's Astoria section.[84] "My experiments became very unpopular around the house," he once said.[85] The new workshop was where Kornei joined him[86] and where shortly afterward he achieved the breakthrough that convinced Carlson xerography could have a commercial future.[87] Kornei departed several months later,[88] and Carlson, not especially handy himself with

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75. *See id.*

76. *See id.*

77. *See* Carlson, *supra* note 5, at 1.

78. *See* Ermenc, *supra* note 70, at 9.

79. *See* Dinsdale, *supra* note 4, at 6.

80. *See id.*

81. *See* Golembeski, *supra* note 7, at 12.

82. *See* Chester Carlson, Acceptance address at the Horatio Alger Award Presentation (Date and location not recorded) (Transcript on file with the New York Law School Law Review).

83. *See* Golembeski, *supra* note 7, at 12.

84. *See* Dinsdale, *supra* note 4, at 11.

85. *Id.*

86. *See* PELL, *supra* note 1, at 13.

87. *See id.* at 14.

88. *See id.*

the logistics of laboratory work and model building, continued to depend on occasional hired part-time help as he pressed on alone to refine his discovery.[89] When he could find nobody else, he fell back on Kornei's workshop skills by long distance,[90] shipping materials and instructions to him in Cleveland until Kornei finally wrote that he could no longer spare the time.[91]

None of this behavior may have been especially striking in an inventor on the threshold of an entirely new technology in the 1930s. But Carlson persisted in his solitary work habits even after a small army of scientific and engineering talent had clustered around his project.[92] For several years after joining Haloid in Rochester as a consultant he worked by himself at home.[93] That may have been partly because Haloid was bursting at the seams of its space and had no extra room for him.[94] Still, even when he finally took office and lab space at the company, it was in a single twenty-foot room overlooking a parking lot where he continued to do research and experimentation independently, aided only by the full-time assistant Haloid now assigned to him.[95] Horace Becker, an engineer who joined the company several years later, remembers Carlson as a powerful but distant presence, visible only occasionally on the fringes of what by then was a highly organized and frantic home stretch effort to get the 914 out the door.[96]

"I think he was a lonely person,"[97] Dorris Carlson summed up in retrospect. "He didn't speak his thoughts very easily and there are not many scientists who want to explore beyond the confines of conventional science. For some reason, I am sure he did not make his feelings known."[98] Carlson himself would have agreed. He might also have

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89. *See* Letter from Chester Carlson to Otto Kornei (Feb. 15, 1941) (on file with the New York Public Library Special Collections).

90. *See id.*

91. *See* Letter from Otto Kornei to Chester Carlson (March 1941) (on file with the New York Public Library Special Collections).

92. *See* LINOWITZ, *supra* note 3, at 65.

93. *See* PELL, *supra* note 1, at 68.

94. *See id.*

95. *See id.* at 69.

96. *See* Interview by David Tomlin and David Rubin with Horace Becker, retired Xerox vice president in Rochester, N.Y. (Jan. 28, 2000).

97. *See* Carlson, *supra* note 20, at 19.

98. *Id.*

listed the trait among his assets. He once said, "because of my rather lonely life as a child and youth, I developed my own habits of thinking and working."[99] "This led me down some channels of thought which had been neglected by others."[100]

IV. XEROGRAPHY IS BORN

Private though it may have been, Carlson's conviction that he had an important contribution to make and that it would probably involve inventions, carefully patented, was deep and of long standing. His older cousin, Roy Carlson, remembered a twelve-year-old Chester solemnly declaring, "Some day I will make a big invention."[101] He systematically kept notebooks from an early age, some of which survive among his papers. The pages include ideas for a ball point pen, tissue handkerchiefs, and cigarette filters.[102] Carlson concluded the ball point pen was impractical.[103] What may really have discouraged his boyish interest, however, is that he actually conducted a patent search and found that another inventor had beaten him to the punch by half a century.[104] For a short time in what may have been the seed of his later interest in the graphic arts, he produced a little newspaper, handwritten at first, but later neatly typed and reproduced with the help of a printer who was one of his early employers.[105]

Carlson continued the sedulous recording of his ideas and thoughts in notebooks during his college years.[106] There was a good deal of the youthful angst and insecurity one would expect to find. "I am the opposite of the best ideal of a fine man,"[107] he wrote in one despairing entry.

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99. *See* Carlson, *supra* note 82, at 1.

100. *Id.*

101. *See* Carlson, *supra* note 20, at 10.

102. *See* Carlson, *supra* note 12, at 2.

103. *See* PELL, *supra* note 1, at 5.

104. *See id.*

105. *See* Dougherty, *supra* note 13, at 8.

106. *See generally* Chester Carlson, Personal diaries and journals, (on file with the New York Public Library Special Collections).

107. *See* Chester Carlson, Diary entry (Jan.12, 1929) (on file with the New York Public Library Special Collections).

But there are also strikingly accurate glimpses of the future that lay ahead for him. In fact, one senses they are not glimpses at all but declarations of an already well-formed intent. In a list of many career possibilities he compiled for himself in 1929, number three was "invention."[108] "I have my eye on this field," he mused, "and it may be my best chance."[109] Only a few weeks later, he scribbled this passage:

> I now feel fairly well determined upon the direction in which I shall extend my efforts hereafter. I will constantly work toward the ultimate object of operating and personally controlling a company . . . for the development and exploitation of inventions. The firm will follow several schemes: (1) . . . promising inventions will be purchased and attempts made to let the rights of use or mfg. out on royalty or other basis. The inventor will always be given a fair deal. (2) A close touch will be kept with all developments in technology and pure science . . . . Likely ideas will be developed in a research and development lab . . . . (3) Extraordinarily productive inventors will be induced, if possible, to enter into some arrangement whereby we are given the rights to all their inventions, present and future.[110]

The acute awareness of the importance of patents and of documenting "rights" to original ideas appears frequently. In one journal entry, he began an essay portentously entitled "The Individual vs. Society" with this parenthetical affirmation:

> At present I am aware of no writings on the above subject, these thoughts are original, I have discussed them with no one nor has anyone ever suggested to me that there could be any such relationship as the title sug-

108. *See* Chester Carlson, Diary entry (Aug. 4, 1929) (on file with the New York Public Library Special Collections).

109. *Id.*

110. *See* Chester Carlson, Diary entry (Oct. 29, 1929) (on file with the New York Public Library Special Collections).

gests.[111]

Yet among these early indications of Carlson's reflexive self-protection are equally positive signs of a more generous view of human possibilities and of his own: "My fancy (perhaps stimulated by things read and seen) catches glimpses of a higher, more beautiful, happier, more stimulating life than can be gotten by following usual present day procedure."[112] That was Carlson the visionary speaking, but it was Carlson the inventor, law student, and patent expert who filed his first patent application on October 18, 1937.[113] As a prelude the month previous, he had with his customary prudence asked for, and received, permission from P.R. Mallory to pursue his invention in his own name.[114] Xerography at that time existed only as a concept. Carlson had yet to duplicate an image with it. "[I] decided to protect my invention date by filing a speculative or semi-theoretical application,"[115] he told the Rochester Patent Law Association years later. "Naturally this involved a considerable amount of educated guessing based on rather limited scientific information."[116]

Patent number 2,221,776, "Electron Photography," was granted November 19, 1940.[117] By then, however, Carlson and Kornei had long since had their breakthrough in the Astoria workshop. On October 22, 1938, Kornei swabbed a sulfur plate with cotton to create a static charge and placed a glass slide over it with "10-22-38 Astoria" written across it in India ink.[118] Then he flashed a light on the plate through the slide.[119] The exposure to light removed the charge from areas of the plate not masked by the writing.[120] Next Kornei dusted the plate with powder that

111. *See* Chester Carlson, Diary entry (Jan. 31, 1929) (on file with the New York Public Library Special Collections).

112. *See* Chester Carlson, Diary entry (Aug. 4, 1929) (on file with the New York Public Library Special Collections).

113. *See* Dinsdale, *supra* note 4, at 10.

114. *See* Letter from Chester Carlson to P.R. Mallory (Sept. 29, 1937) (on file with the New York Public Library Special Collections).

115. *See* Chester Carlson, Address to the Rochester Patent Law Association 7a (May 3, 1965) (transcript on file with the New York Law School Law Review).

116. *Id.*

117. *See* Carlson, *supra* note 5, at 3.

118. *See* PELL, *supra* note 1, at 14.

119. *See id.*

120. *See* Xerox Corporation, *supra* note 57, at 4.

would adhere to the remaining charged areas and pressed it to a heated sheet of wax paper.[121] And there it was, the world's first xerographic copy. The following April, Carlson modified his previous application in a new patent filing based on his successful experimental results.[122] His "Electrophotography" patent, number 2,297,691, was granted on October 6, 1942. It was the basic xerography patent, the one that drew Frank Steinhilper's effulgent praise, and the clock immediately began to run on Carlson's seventeen years of exclusivity.

Judging from the testimony of his Haloid-Xerox colleagues, Carlson could not escape the sound of that ticking clock. He began to agitate almost immediately upon joining Haloid in 1948 for urgent steps to assure the company's future with patents on the improvements to Carlson's basic procedure that would remain in force when number 2,297,691 had run its course.[123] "He kept making the point that his basic patents were going to expire,"[124] wrote Sol Linowitz, Haloid's counsel in those years. "We weren't doing enough about that, we weren't moving fast enough."[125] In response to Carlson's prodding, the company formed a committee to study the problem,[126] and a year later it hired Steinhilper as its patent attorney.[127] Carlson remained dissatisfied, citing numerous projects under way in Haloid's research laboratories that ought to be protected.[128] But under his prodding the patenting campaign gained traction, and by the time the 914 showed the world in 1959 how valuable xerographic technology really was, the company held 169 unexpired patents.[129]

Steinhilper's admiration for Carlson's patent acumen was unreserved and sincere.[130] He was especially impressed that Carlson continued the habit that began in 1938 of writing his own patent applications concur-

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121. *See* PELL, *supra* note 1, at 14.

122. U.S. Patent No. 2,297,691 (application dated April 4, 1939 and granted, Oct. 6, 1942) (on file with the New York Public Library Special Collections).

123. *See* LINOWITZ, *supra* note 3, at 64.

124. *Id.*

125. *Id.*

126. *See* PELL, *supra* note 1, at 130.

127. *See id.* at 60.

128. *See id.* at 130.

129. *See id.* at 131.

130. *See id.* at 60.

rently with his research and experimentation.[131] Linowitz was a Carlson fan as well, at least in the realm of patent law,[132] though he noted at least one instance in which Carlson's usually reliable prescience failed him in the antitrust area.

In June 1953, Chet wrote a letter proclaiming that "in our patentable inventions, Haloid-Battelle-Carlson hold the keys to possible dominance of a tremendous new industry. What Bell is to the telephone – or more aptly, what Eastman is to photography – Haloid could be to xerography."[133] The letter came back to haunt the company a quarter century later as Xerox defended itself against a counterclaim by a patent infringement defendant that Xerox had refused to license its competing copier.[134] The claim failed, but not without trouble and expense in an era during which Xerox was fighting other legal battles on many fronts.[135]

If Carlson was unyielding, on patent matters, as Linowitz described him,[136] there is as much evidence to show that his ferocity was directed toward protecting the incentives to invent useful products as there is to show he was looking out for his personal interests. There is more passion in Carlson's behavior and his utterances for the act of creating things than for acquiring them. Joseph Wilson, Haloid president, first businessman to share Carlson's vision for xerography, and Carlson convert to the creed of aggressive patenting,[137] may have summed it up best: "During the early years of xerography we were investing almost as much in research as we were realizing in profit. Unless the first faltering efforts had been protected from imitators, the business itself probably would have foundered..."[138]

Wilson referred to the years in which Haloid was making modest sums from early graphic arts applications of xerography while the company labored to create the real office copier that few experts believed anybody wanted. But without the security of the basic patents, it is doubtful that Haloid would ever have put itself at risk of foundering as Wilson suggests. And since nobody else seems to have believed that the

131. *See id.* at 131.
132. *See* LINOWITZ, *supra* note 3, at 93.
133. *Id.*
134. *See id.*
135. *See id.*
136. *See id.* at 64.
137. *See Hearings, supra* note 14 at 1111 (statement of Daniel V. DeSimone)..
138. *Id.* at 37.

world wanted plain paper copies, one can only speculate as to how long it would have been before we were given the ability to make as many duplicates as we liked at the push of a button.[139]

V. CARLSON SOLIDIFIES HIS INTEREST

In his conduct over the years, Carlson manifested the conviction that the main purpose of patent law is not to protect inventors, but to protect invention.[140] His needs were relatively modest, and where his legal rights protected only his personal interests, Carlson's guard seemed to drop a bit. There is no better illustration than in his relationship with Otto Kornei, the man he hired in 1938 to help reduce xerography to practice.

Carlson by his own admission was not much good at manual tasks. "Ability in doing things with hands or things requiring muscular coordination or strength very low,"[141] he jotted in his journal while he was at Caltech. "I can't even saw a board straight."[142] He needed someone with laboratory skills. But even though Kornei was a recent immigrant who needed work,[143] it took some persuading to get him to sign on to a project as speculative as Carlson's seemed.[144] In a carefully worded letter agreement dated October 6, 1938, Carlson agreed to pay Kornei $90 per month for his part-time services,[145] an expense that put him "out on a financial limb"[146] but which his indifferent laboratory skills forced on him.[147] Additionally, he promised Kornei twenty percent of anything Carlson earned from the basic patents "at any future time"[148] up to

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139. *See id.* at 32-37.

140. *See* Carlson, *supra* note 49.

141. *See* Chester Carlson, Diary entry (Jan. 20, 1929) (on file with the New York Public Library Special Collections).

142. *Id.*

143. *See* PELL, *supra* note 1, at 13.

144. *See id.*

145. *See* Carlson, *supra* note 23.

146. *See* Golembeski, *supra* note 7, at 13.

147. *See* PELL, *supra* note 1, at 13.

148. *See* Carlson, *supra* note 23.

$10,000 and then ten percent of Carlson's earnings after that.[149] The offer seems generous. But Kornei considered prospects for any great success from the venture marginal, and it took all of what Carlson put on the table to bring him aboard.[150] In return, Kornei committed himself to "apply [him]self diligently"[151] to the work, provide Carlson with careful notebooks on his progress, and assign Carlson the rights to anything he invented in the course of producing a working model.[152]

By July of the following year with the Astoria mission accomplished, Kornei had moved to Cleveland to work for the Brush Development Co.[153] and Carlson suggested it would be best that they unwind their deal.[154] He promised that Kornei "would never have to regret" the step if xerography somehow became a success.[155] Kornei was to give up future rights to xerography revenues, and Carlson would surrender rights to an electronic scanning process Kornei had developed while their contract was in force.[156] Kornei included his acceptance of Carlson's proposal in a friendly letter dated July 25, 1939.[157] Carlson acknowledged Kornei's rescission in an equally cordial note exactly one month later,[158] and there the matter rested for years.

The two friends stayed in close touch during that time.[159] Carlson was hard at work trying to improve the quality of his process over Kornei's murky Astoria copy.[160] Kornei pitched in when Carlson needed help making better xerographic plates than he could produce on his own.[161] When Carlson's patent number 2,297,691 was granted in 1942,

149. *See id.*

150. *See* PELL, *supra* note 1, at 13.

151. *See* Carlson, *supra* note 23.

152. *See id.*

153. *See* Kornei, *supra* note 25.

154. *See id.*

155. *See* Kornei, *supra* note 26.

156. *See* Carlson, *supra* note 23.

157. *See* Kornei, *supra* note 25.

158. *See* Letter from Chester Carlson to Otto Kornei (Aug. 25, 1939) (on file with the New York Public Library Special Collections).

159. *See generally* Carlson-Kornei correspondence (on file with the New York Public Library Special Collections) (relationship evidenced by correspondence between the parties from July 25, 1939 to Oct. 24, 1943).

160. *See* Carlson, *supra* note 89.

161. *See* Letter from Otto Kornei to Chester Carlson (Feb. 19, 1941) (on file with the New York Public Library Special Collections).

Kornei mailed congratulations.[162] The following year as Kornei's citizenship hearing was approaching, he asked Carlson to testify as a character witness.[163] By 1950, with Carlson established at Haloid, there was an exchange of letters about a possible application for xerography on a Brush Development project.[164] In 1956, Carlson invited Kornei to come to work at Haloid.[165] The company had recently formed a "Small-Copier Committee" to begin feasibility studies that would eventually lead to the 914 copier.[166] But Kornei had already accepted an offer to join IBM in Poughkeepsie, New York.[167] Instead of the job, Carlson sent Kornei a spontaneous gift of 100 shares of Haloid stock,[168] presumably intending it as fulfillment of his 1939 promise that Kornei would share in whatever future success the basic patents might produce.

If Kornei was pleased with the gift in 1956, he experienced a drastic change of heart in 1960.[169] Customers were starting to rave about the new Xerox 914, and sales were showing early signs of the coming explosive growth.[170] Kornei realized that his offhanded 1939 consent to revocation of his original profit sharing deal with Carlson had turned out to be a costly mistake.[171] "Today, I cannot help but being bitter about the part I played in the development of Xerography," Kornei wrote Carlson in a reproachful and self-pitying letter dated June 7, 1960.[172] "I feel like the man who has plowed rough ground and seeded it and has received but a minute share in the harvest."[173] In an "act of friendship," Kornei said he had signed away the promise of great wealth "just to be nice."[174]

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162. *See* Letter from Otto Kornei to Chester Carlson (Nov. 1, 1942) (on file with the New York Public Library Special Collections).

163. *See* Letter from Otto Kornei to Chester Carlson (Oct. 24, 1943) (on file with the New York Public Library Special Collections).

164. *See generally* Carlson-Kornei correspondence (1950) (on file with the New York Public Library Special Collections).

165. *See* Letter from Otto Kornei to Chester Carlson (July 15, 1956) (on file with the New York Public Library Special Collections).

166. *See* PELL, *supra* note 1, at 84.

167. *See* Kornei, *supra* note 163.

168. *See* PELL, *supra* note 1, at 23 n.13.

169. *See* Carlson, *supra* note 26.

170. *See* Golembeski, *supra* note 7, at 15.

171. *See* Kornei, *supra* note 163.

172. *Id.*

173. *Id.*

174. *Id.*

He urged the inventor to do something to redress "a phantastic [sic] injustice."[175]

Carlson was stunned.[176] The demand for compensation alone was startling enough, but far worse was the implication by his former colleague and presumed friend that Carlson had manipulated and duped him into giving up his rightful share in the xerography bonanza nobody could have foreseen in 1939.[177] Carlson insisted in his June 18th reply that the revocation had been reciprocal. Each engineer came away from it with full rights to his own inventions.[178] Carlson went on to develop xerography, whereas Kornei did nothing with his electronic beam scanning idea. Where was the injustice in that?[179]

As for Kornei's relative contribution to xerography, Carlson noted that he himself had filed two patent applications, filled several notebooks and laid enough experimental groundwork before he hired Kornei that the Austrian was able to produce a xerographic copy in just one month.[180] "You worked for 6 months on a part time basis as a consultant for pay," Carlson wrote. "I worked for 13 years, from 1935 to 1948 before I received one cent of return."[181] Carlson calculated that he had spent $20,000 of his own money on his idea before any money started coming back.[182] "You invested nothing," he pointed out.[183]

Carlson's letter was as self-pitying as Kornei's. "It was only my tremendous faith in the process that kept me going between the time you left me in 1939 and the year 1944 when I was able to enlist the interest of Battelle, the very first serious interest shown by anybody outside myself," Carlson wrote.[184] "Believe me there were many times after you left when I became thoroughly discouraged and even put the idea on the shelf, only to take it down again and continue plugging."[185]

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175. *Id.*
176. *See* Carlson, *supra* note 29.
177. *See id.*
178. *See id.*
179. *See id.*
180. *See id.*
181. *Id.*
182. *See id.*
183. *Id.*
184. *Id.*
185. *Id.*

As he went on in the letter to defend his conduct, Carlson's dual training as a lawyer and engineer revealed itself. Reviewing their respective contributions to xerography in detail, Carlson calculated that if Kornei's represented one unit, Carlson's would tip the scale at 110 units.[186] Carlson noted that his gift to Kornei of Haloid stock four years earlier was now worth $22,000.[187] That, plus the salary he had paid Kornei in 1938, was "pretty good for 6 months part time work."[188] Multiply all that by 110, Carlson said, and you get $2.5 million, a far greater sum than Carlson had yet realized from his invention.[189] "Or have I missed something," he asked in conclusion.[190]

He was really addressing the question to himself. Behind his arguments and indignation, Carlson appeared to be far from sure that Kornei did not have a compelling point. Even allowing for the incontestable facts of the revoked contract and Kornei's very minor role in the long xerography saga, Carlson felt his assistant might have a deeper claim that went beyond the letter of the law.[191] Before mailing his letter, Carlson sent it to his personal attorney for a second opinion, saying he would rather risk acknowledging some obligation to Kornei than "have him remain with a feeling that he has not got a fair share of the deal."[192] The attorney, Charles S. Wilcox of Rochester, told Carlson that Kornei's claim was groundless under the law and unreasonable by any other measure.[193] He congratulated Carlson on his generous spirit, suggested no changes,[194] and the letter went into the mail.

Kornei was not the least bit impressed.[195] "I had a ten percent share in Electrophotography – with no strings attached," he wrote back on July

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186. *See id.*

187. *See id.*

188. *Id.*

189. *See id.*

190. *Id.*

191. *See* Letter from Chester Carlson to Charles S. Wilcox, Attorney (June 18, 1960) (on file with the New York Public Library Special Collections).

192. *Id.*

193. *See id.*

194. *See* Letter from Charles S. Wilcox, Attorney to Chester Carlson (June 22, 1960) (on file with the New York Public Library Special Collections).

195. *See* Letter from Otto Kornei to Chester Carlson (July 25, 1960) (on file with the New York Public Library Special Collections).

25, 1960.[196] "Why complicate a simple matter?"[197] Yes, Carlson had indeed missed something: "That I had a share in an invention which proved successful beyond expectations and which I relinquished because a friend asked me to – and not for any speculative reasons."[198] Kornei blamed himself for his loss, though the putative self-reproach took the form of accusation: "I acted like a friend – and you like a businessman."[199]

On August 12, Carlson replied with a terse single line: "I have your letter of July 25. Specifically what is it that you want?"[200] Kornei wasted no time answering. If he couldn't have his 1939 rescission back, he would take more stock.[201] On September 15, Carlson instructed the trust officer at his Rochester bank to assign 500 shares of Haloid Xerox stock to Kornei and his wife as "a gift."[202] In a letter to Kornei the same day, Carlson said the value of the stock approximately equaled what Carlson calculated that Kornei would have been entitled to had their 1939 contract remained in effect.[203] Kornei was ecstatic when the news reached him of his new shares.[204] "Let me assure you," he wrote on October 1, "that their great moral and ethical significance equal their financial value to me."[205]

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196. *Id.*

197. *Id.*

198. *Id.*

199. *Id.*

200. *See* Letter from Chester Carlson to Otto Kornei (Aug. 12, 1960) (on file with the New York Public Library Special Collections).

201. *See* Letter from Otto Kornei to Chester Carlson (Aug. 30, 1960) (on file with the New York Public Library Special Collections).

202. *See* Letter from Chester Carlson to Robert E. Platt, Trust Officer of Lincoln Rochester Trust Co. (Sept. 15, 1960) (on file with the New York Public Library Special Collections).

203. *See* Carlson, *supra* note 30.

204. *See* Letter from Otto Kornei to Chester Carlson (Oct. 1, 1960) (on file with the New York Public Library Special Collections).

205. *Id.*

VI. CONCLUSION

It has been written that no man is an island.[206] It might be said with equal truth, that no tract or parcel of intellectual property, no matter how well-fenced and fortified, is an island either. Acts of human creativity spring from a common store of wisdom and strive toward the fulfillment of common needs and common dreams. Chester Carlson was a skillful builder of fences and fortifications. However, this article contends that the impulse to create something useful is what drove him hardest, and that he also felt the tug of obligation to all who eased his way.

If there was anything grudging in Carlson's acknowledgment of Otto Kornei's claim, it was only enough to cool their friendship, not to kill it. The two men eventually resumed cordial relations,[207] and Carlson seems to have continued to ponder exactly what part of his life and work an inventor can truly call his own and what part must be relinquished as a legacy to the rest of us. He had evidently formed some conclusions by the time he traveled with his cousin Roy to Copenhagen for a graphic arts trade show a few years before his death.[208] Coming to the Xerox display, the pair stood silent and anonymous as a young salesman told a group of listeners about Chester Carlson and the origins of xerography.[209] When the presentation was over, Carlson said a simple "thank you" and strolled away.[210] Roy remarked that the salesman would have been thrilled to know that the subject of his spiel was standing right in front of him.[211]

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206. *See* John Donne, *Nunclento sonitu dicunt, Morieris*, in JOHN DONNE SELECTED PROSE 100-101 (Helen Gardner & Timothy Healy eds., Oxford Univ. Press 1976). The entire verse is as follows:

> No man is an Island, entire of itself; every man is a piece of the Continent, a part of the main; if a clod be washed away by the sea, Europe is the less, as well as if a promontory were, as well as if a manor of thy friends or of thine own were; any man's death diminishes me, because I am involved in Mankind; And therefore never send to know for whom the bell tolls; It tolls for thee.

207. *See generally* Carlson-Kornei correspondence (on file with the New York Public Library Special Collections) (showing a warming in the relationship between Carlson and Kornei, from June 7, 1960 to Dec. 16, 1964).

208. *See* Carlson, *supra* note 20, at 10.

209. *See id.* at 11.

210. *Id.*

211. *See id.*

"He may have been happy for a little while," Carlson replied.[212] "But it was his story and his show, and I would have been taking the light away from him and putting it on myself."[213]

212. *Id.*
213. *Id.*