Working Knowledge

EMPLOYEE INNOVATION and the RISE of CORPORATE INTELLECTUAL PROPERTY, 1800–1930

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The modern law of corporate intellectual property was created during the same span of years that produced both the archetypes of reactionary legal conservatism and the probing critiques of law that laid the foundations of modern progressive legal thinking. These were the years of what Owen Fiss called, in his history of the Fuller Court (1888–1910), “the negative examples”—the cases that live in infamy among modern progressive lawyers for their heartlessness and racism: *Lochner v. New York* (which invalidated protective labor legislation); *Plessy v. Ferguson* (which approved racial segregation); *In re Debs* (which gave the president the power to use troops to end a strike); the Danbury Hatters case (which treated labor unions as illegal conspiracies to restrain trade); *Adair* (which invalidated a law granting a right to join a union); the Insular Cases (which denied constitutional rights to some people in territories annexed by the United States); and the Chinese Exclusion cases (which upheld the first racial restriction on immigration and excluded Chinese immigrants from citizenship). The late nineteenth century was a period of transition from what Morton Horwitz termed the “old conservative” worldview of “Classical Legal Thought”—“one that presumed that the existence of decentralized political and economic institutions was the primary reason why America had managed to preserve its freedom”—to a modern view. The modern worldview was characterized by the realization that the modern economy was dominated by large-scale, market-dominant corporate enterprises. Lawyers and other social theorists worried about the need to reform
legal and other institutions to respond to the new reality and to address the growing economic, social, and political inequality that threatened American freedom.\textsuperscript{2}

As courts stepped up to defend property rights against the claims of workers, labor unions, reformers, and reform-minded legislatures and insisted upon the power of corporations to sweat their workers, they also became architects of the legal edifice of corporate intellectual property. While the anxiety about the social, economic, and political threats posed by the seemingly unchecked power of big business is well known when the combatants were steel magnates and labor unions, or banks and small farmers, less well known is the frustration experienced by inventors and creative people at the enforcement of newly minted rules dictating that innovations would henceforth be company property, and that hopes for advancement and wealth would be entirely dependent on the goodwill of their managers and the largesse of their firms.\textsuperscript{3}

The legal and business changes in patent ownership in the last decades of the century represented a significant challenge to and demanded a redefinition of the free labor ideology as it existed after the Civil War.\textsuperscript{4} Autonomy and entrepreneurship were essential to free labor, and both were founded, in part, on control over the fruits of one's ingenuity. Charles McCurdy identified two crucial tenets of the free-labor ideology that later manifested itself in the Lochnerist "liberty of contract" doctrine after 1886.\textsuperscript{5} Corporate control of innovative employees undermined both. First, by divesting inventive employees of the rights over their ideas, the new intellectual property rules threatened the first tenet, which was that "[e]ach person determined how long he would work and on what terms. And not only were those decisions his to make but the fruits of such labor were his to keep." Second, it threatened the second tenet that free labor was "labor with economic choices, with the opportunity to quit the wage-earning class." Northerners, McCurdy asserted, "claimed that the North's dynamic, expanding economy, itself a product of the 'free labor' system, generated ample opportunities for the wage-earner's advancement." As the \textit{New York Times} phrased it in 1857, "Our paupers today, thanks to free labor, are our yeomen and merchants of tomorrow." The "opportunity for upward mobility and eventual independence" were crucial, McCurdy says, because they distinguished free labor in the North from the "degraded condition" of southern labor. Loss of intellectual property rights diminished the prospects for entrepreneurship and demanded reexamination of the ideology of free labor that was central to nineteenth-century American law and politics. This change in legal doctrine and in company
practice redefined the meaning of free labor and its relationship to middle-
class status.

By the end of the _Lochner_ era, the free-labor ideology, whose existence had
been perpetuated in an oddly tortured form in the _Lochner_-era cases, began
to take other forms. Judges no longer needed to construe employment agree-
ments to maximize the possibility for upward mobility through intellectual
property ownership because the ideological premises and social function of
the liberty of contract and free labor ideologies were no longer a necessary
bulwark against labor legislation and a reconciliation of free labor with the
factory system. A middle class of educated men could exist securely but in a
position of complete dependence in large corporations because of enlight-
ened management policies. This new middle class did not need economic
independence and upward mobility through entrepreneurship; it needed the
status conferred by a good education, a stable job with a respected corpora-
tion, and the comfortable standard of living of the consumer society.

Patent law, copyright law, trade secret law, and the enforcement of non-
compete agreements expanded the rights of employers dramatically between
roughly 1895 and 1930. The rhetorical underpinnings of the doctrine changed
perceptibly. In addition, whereas courts in the 1870s and 1880s found trade
secrets or enforced patent and copyright assignments only on the basis of
express contracts, after 1895 courts began to state that the duty to guard
trade secrets and to assign patents was an implied term in all employment.
Contract lost whatever character it had as a description of the actual under-
standing of the parties and instead became prescriptive of the proper content
of every employment relationship. A New York appellate court stated the
principle plainly in 1896 while upholding an injunction against a former
factory superintendent and his assistant from using any knowledge they had
acquired over the course of their entire working lives at a firm. There was no
express agreement to guard company secrets, and the employees complained
that the injunction would render them unemployable because all their work-
ing knowledge came from the one firm. The court nevertheless said, “[W]e
do not see why the defendants . . . are not under just as strong an obligation
to observe and keep sacred the trust reposed in them as they would be had
they reduced the contract which the law implies to writing.” Around 1900, a
couple of courts recognized employers as the rightful owners of workplace-
generated copyrights, and in 1909 Congress amended the Copyright Act to
create the concept of an employer as the author of a work made for hire.6

The late nineteenth and the early twentieth centuries witnessed a rad-
cially new relationship between people and things. The proliferation of ex-
positions and world's fairs in the United States portrayed modernity as a parade of new things. These ranged from new inventions, including new and improved locomotives and machines, to a vast array of consumer goods and commodities. The quantity and sophistication of advertising exploded, transforming American taste and creating enormous demand for all sorts of things. The huge array of companies that sprang up to serve the market for consumer goods became increasingly aware of the value of newness, the importance of brands, and the need for legal rules to protect the company's right to control them. Thus intellectual property rights of all kinds were inextricably tied to the expanding consumer culture.

The expansion of the scope of copyright and patent to include ever more things mass-produced in a commercial setting did more than increase the incentives for corporations to hire creative workers to create ever more patented and copyrighted material. It gradually changed the popular understanding of patent, copyright, and innovation, and perhaps the self-understanding of idea workers. Innovation and creation were no longer the province of the artist, the intellectual, the scientist, or the tinkerer. It was the business plan and the marketing strategy of behemoth firms like General Electric, Kodak, Du Pont, and Ford.

A consumer culture focused on mass-produced novelty: on the pursuit of a middle-class standard of living measured by consumption and display of brand-name consumer goods of all kinds; on the endless proliferation of brand names and the thorough penetration of intellectual property of all kinds into daily life—all the hallmarks of the emerging American popular culture in the early twentieth century—has a very different relationship to idea creation and ownership than the culture of 1895. But the relationship is hardly unidirectional. Technological development had radically changed life by 1930—automobiles, telephones, electricity, cameras, and radios became features of middle- and upper-class daily life. Films and recorded music became staple entertainment. New magazines and new advertisements changed tastes. All these things brought home to Americans the impact of intellectual property and the value of innovation, even as they laid the groundwork for the demythologizing of the inventive process and desanctification of the creation of art, music, and literature.
Corporate Management of Science &
Scientific Management of Corporations

Many large corporations established research and development facilities in
the first decade of the twentieth century to systematize invention. Innovations became more likely to be made in a research lab or in some other collective setting by someone working as an employee of a corporation. At the same time, large businesses adopted the methods of scientific management. They restructured jobs so that complex tasks were divided up and performed piece-meal by less-skilled workers, they rationalized production so that supervisors rather than skilled labor and foremen controlled the manufacturing process, and they improved record keeping so that the productivity (and therefore the wages) of each worker could be measured and calibrated. The pace and order of work and many aspects of working conditions were no longer left to the discretion of individual workers and foremen. The development of personnel management within a framework of managerial capitalism transformed working life. In the first few decades of the twentieth century, science was applied to management and management was applied to science. The scientific management of corporate science changed the ownership of ideas in the workplace.

The spread of bureaucratic employment practices and the growth of firms eventually narrowed differences in legal status ("master" and "servant") that previously had separated creative employees from machine operators and office clerks. After 1900, just as the social class line was becoming increasingly clear between the middle class and the working class and between office and manual workers, the legal class line between working- and middle-class employees was becoming increasingly faint. All were employees of large firms,
not servants, but not masters. White male office workers still expected to rise in the business world and saw themselves as superior to factory workers, but in law the distinction between the legal rights of a middle-class employee and a working-class employee had largely disappeared.¹

The newly defined employment contract assigned ownership and control of intellectual property rights, including patents and trade secrets, to the corporate employer. Lawyers and courts embraced the notion of collective invention in the newfangled corporate research facility as a basis for reallocation of ownership rights to employee innovation. Some of the research employees no doubt relished the job security and the opportunity to work collaboratively on increasingly complex and sophisticated technology under the aegis of a well-respected corporation in the growing R & D facilities at large companies. They happily traded the rights to whatever intellectual property they generated for a secure career with a reputable firm. It may be that most R & D employees benefited more from the corporate management of science than they would have in the entrepreneurial world of the independent inventor of the nineteenth century. But many R & D employees thought they would have been better off with greater opportunities for individual entrepreneurship and resented the corporate control that modern law and modern management allowed. They did not think they benefited from the implicit trade of entrepreneurial opportunity for stability of corporate employment and had difficulty accommodating themselves to the new role of the corporate scientist as being dependent on corporate employment and subservient to corporate managers.

The New Employment Contract and the
Emergence of Industrial Research

A phenomenon unknown before 1840—the large, multi-unit, professionally managed business corporation—was the dominant form of business by 1930. The American economy was controlled as much by managers as by markets, and people worked for others rather than for themselves.² Courts realized that combinations were rapidly replacing individuals in business relations and they began to transform their vision of the employment contract to fit the new reality. As Justice Oliver Wendell Holmes famously observed in Vegelahn v. Gunther, an 1896 case in which concerted action by a labor union challenged the liberal individualist conception of work relations, “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.”³ The management of the
thousands of workers employed in the behemoth firms became ever more systematic and bureaucratic. Inventive employees were less likely than ever before to be entrepreneurs founding their own small firms, tending instead to be mid-level employees of a research division of a large corporation.

Factory manufacturing shifted control over the production process from workers to management and, in particular, shifted knowledge about the processes of production from skilled labor to middle management. Workers and labor leaders had long known that their negotiating power vis-à-vis their employers came from their knowledge about work process; as Bill Haywood, the visionary leader of the radical Industrial Workers of the World union, succinctly stated, “The manager’s brains are under the workman’s cap.” Along with the better-known fights over wages, hours, and workplace safety, one of the most important workplace power struggles was over control of that knowledge. Frederick Winslow Taylor’s scientific management was one weapon in that struggle; another was the redefinition of the employment contract that gave the corporation control over employee innovations and intellectual property. As Taylor explained, the key to modern (“scientific”) factory management was to understand that workmen in each trade “have had their knowledge handed down to them by word of mouth . . . The ingenuity and experience of each generation . . . have without doubt handed over better methods to the next. This mass of rule-of-thumb or traditional knowledge may be said to be the principal asset or possession of every tradesman.” Taylor went on to explain that the “foremen and superintendents know, better than any one else, that their own knowledge and personal skill falls far short of the combined knowledge and dexterity of all the workmen under them.” Scientific management taught the corporation’s managers to control all that knowledge. “Information formerly regarded as part of the foreman’s ‘secret’ store of knowledge, such as wage rates and job content, was appropriated by the personnel manager much as the secrets of production had been appropriated by the engineer.”

The transformation of technology played a role in this process alongside the transformation of the business corporation. While many people with some inventive ability, education, skill, and access to a workshop might have been able to design and patent an improvement to the relatively simple steam engines of the early nineteenth century, by the end of the century only those with highly specialized knowledge of metals and mechanical engineering who had access to a locomotive and several miles of railroad track would be in a position to patent a major improvement. As technology grew exponentially more complex, the firms and factories that developed it grew larger. Opportunities for individual invention and entrepreneurship

*Corporate Management of Science*
based on individual patent ownership became less prevalent. Instead, it was far more likely in the early twentieth century that an inventor would be an employee of a large corporation and work with other employees using the tools and material of his employer to develop a patent. Invention became less democratic and entrepreneurial at the individual level. Both invention and entrepreneurship became corporate.8

Patent law requires the inventor(s)—natural persons—to be named in the patent application; a corporation could not be awarded a patent until 1952.9 In 1885, only 12 percent of patents were assigned to corporations at the time of issuance; by 1950, at least three-quarters of them were.10 Contracts between firms and employees requiring assignment of patents were rare before World War I, but that changed rapidly afterward. Naomi Lamoreaux and Kenneth Sokoloff have shown that between 1870 and 1910 patentees became more likely to assign away their rights to patents at the time the patent was issued. There was a particular increase in assignments to companies (from 24 percent of recorded assignments in 1870 to 64 percent of recorded assignments in 1910), and a significant increase in employees and corporate officers assigning patents to the firm.11

The explosive growth of corporate research and development dramatically changed both the environment in which workplace innovation occurred and how the lay and legal public imagined invention. In the popular and judicial imagination, perhaps more than in actual fact, the hero-inventor experimenting alone in his laboratory or workshop ceded his place to company men in laboratory coats working collaboratively on a corporate payroll to advance the progress of technology.12 Legal doctrine changed accordingly, with twentieth-century courts becoming far more likely than their nineteenth-century predecessors to conclude either that employees were hired to invent and therefore the firm owned all employee patents, even in the absence of a specific agreement to transfer the patent from the inventor to the firm, or that the employee and the firm had validly contracted for assignment of employee patents.13

One of the characteristic features of twentieth-century research and development is the separation of the job functions of invention from those of supervision and management. The employees most likely to invent in large twentieth-century firms were likely to be professionally trained engineers and scientists in R & D divisions whose sole job was to invent, not to run the company. The professionalization of invention enhanced the status of some inventors from tinkerers and mechanics to scientists and professionals. But it also resulted in some employees of substantial education—who might in some measures be of an elevated class position—being treated and being
forced to regard themselves as cogs in a corporate machine more than as men of stature and power within the firm. In Britain as in America, company practices in the management and compensation of inventive employees varied wildly: some rewarded employees handsomely, while others took employee ideas for company use without credit or reward. As firms became more bureaucratic in their management of all aspects of business, the management of R & D was not immune. There are conspicuous exceptions, such as Charles P. Steinmetz, the quirky chief of research at General Electric, who also had a position in management. But chemists and engineers—like most skilled and unskilled white- and blue-collar labor throughout the newly reorganizing firms—were susceptible to being treated like all other inputs to production. All were commodities that must be managed.

Companies found it difficult to elicit innovation, creativity, and loyalty from employees while maintaining control. Managers in the industrial research and development facilities established around the turn of the century at Du Pont, Eastman Kodak, General Electric, Westinghouse, Bell Telephone, and elsewhere struggled to maintain the respect for science necessary to recruit top scientists and an entrepreneurial spirit that would provide incentives to hard work and innovation. Some thought that the regimented managerial structure imposed to ensure that the R & D division was a productive and profitable segment of the firm was anathema to creative science and to entrepreneurial innovation. As law had consolidated corporate power over innovation, books such as the 1931 classic The Psychology of the Inventor began to appear, suggesting that innovation remained a personality trait that would thrive even as individual entrepreneurship disappeared from the world of large corporations and complex technology. It took a generation or more for most firms to work out how to manage creative people, control the diffusion of economically valuable information, and capture the gains of their investment in R & D. Companies sometimes did, and sometimes did not, strike a balance that rationalized R & D while also offering a satisfactory degree of autonomy and a realistic hope of upward mobility for the best and brightest (or just the most successful) of the scientists and engineers in the corporate labs.

A redefined employment contract was the legal device that played the most significant role in facilitating the application of scientific management to employee innovation. Courts redefined the terms of the employment contract to allocate innovations to the employer. As the author of an influential 1903 Michigan Law Review article on employee inventions baldly stated, ownership of inventions was solely a question of contract, “express or implied.” The fact of employment did not alter the inventor’s property in his inventions

Corporate Management of Science
“outside the scope of employment,” the author contended, but an implied contract could. The author did not attempt to explain how courts determined which inventions were within or outside the scope of employment. Nor did he suggest how the courts should decide whether an implied contract allocated intellectual property rights to employer or employee. Rather, he said only that the “essential considerations” included “what the employee was hired to do” and “what rights, expressed or implied,” the employee had given to the employer. In case of doubt, as “where the employer and the employee both claim the invention the presumption is prima facie in favor of the employer.”

Every step of that author’s analysis, especially the last one asserting a presumption of employer ownership, was prescriptive when it appeared to be only descriptive, and no step in the analysis was uniformly supported by the existing law. The cases that the author cited did not stand for the broad proposition claimed, and the article overlooked contrary authority. But in an area of law that had received little scholarly attention, the influence of the article was substantial. It combined ambition to strengthen employer rights with formalist confidence—typical of legal scholarship of the era—that the rigorous application of the “science” of contract law could dispel the apparent disorder in the case law and bring new organization, synthesis, and clarity to the problem of workplace inventions. Given that most law had been noteworthy for zealous protection of employee rights during a sixty-year period when courts were not otherwise terribly sympathetic to workers, the article was a novel effort to apply to employee-inventors the formalist, pro-employer version of contract law that courts had, up to that point, applied everywhere but to employee-inventors.

The new paradigm of corporate invention was incorporated into law through an assessment of the content of the implied (that is, judicially prescribed) contract of employment. Judges began to see that the stimulus to innovation was not individual employee ownership of patents but rather corporate ownership of the results of the research and development in which the corporation had invested. In 1911, a court held that the sole stockholders of a start-up company had a fiduciary duty to their corporation to assign patented improvements on the company’s product that they had developed after the company terminated their employment. The opinion justified a broad duty to assign patents with a lengthy explanation of the collective nature of invention: “An invention is not something that, but for the particular inventor or inventors, would not have been. Inventions come along as the discovery of gas deposits come along—the contribution of some particular person to the world’s knowledge—but if not by that person, then, in the course of time,
and usually in a very short time, by someone else.” The company should justify its ownership of employee patents because the employee, according to the court, has only an idea for a technological advance; the firm created the value in that idea: “[T]he exploration of the laws of nature and mechanics, for something that will aid a specific commercial or business end, practically and commercially is not different from explorations for mineral or gas deposits to a like commercial end. Neither has any value until it is obtained. Both create a value that did not exist before they were obtained.”

Reasoning that invention was a long and arduous endeavor of many contributors, not the product of an individual stroke of genius, courts concluded that agreements to assign future inventions ought to be treated no differently than agreements to assign any other property that someone might acquire in the future. The systematic advancement of technology, one judge said, would be best served by giving corporations control over employee patents because “[p]rotection for the future requires that inventions already controlled be not undermined and diverted by other inventions along the same line.” In *Wireless Specialty Apparatus Co. v. Mica Condenser Co.*, the Supreme Judicial Court of Massachusetts held that employees “wholly engaged in ‘experimental work’” were obligated to treat all their inventions as belonging to their employer. Describing a firm that had converted from World War I production of radio condensers for the U.S. government into peacetime production of magneto condensers for manufacturers of electrical apparatus, the court noted that the inventions at issue were the joint work of several employees and that the employer should own them because the “work was substantially all performed in the plaintiff’s shop, with its tools, at its expense, and under the general direction and supervision of . . . its chief engineer.”

The impact of corporate R & D on the transformation of contracts governing inventions can be seen most clearly in the Supreme Court’s influential 1925 decision in *Standard Parts Co. v. Peck*, which cemented the rule of employer ownership of employee patents. William Peck had worked for Hess Spring and Axle Company in Carthage, Ohio, for five years, ending in 1912. Peck not only had developed the skills of a designer of machinery but also had become a patent lawyer. In 1915, Peck received a call from Mr. Hess, the principal stockholder of Hess Spring and Axle, to see if he was able to help solve a problem the company was having in the manufacture of front springs for Ford motor cars in its plant in Pontiac, Michigan. Initially, Peck declined Hess’s offer to return to work for the company, but he was persuaded to tour several Hess manufacturing plants to see what machinery might be incorporated into the spring making plant. According to Peck, Hess promised that the company would establish a special R & D facility with Peck in charge.

*Corporate Management of Science*
and in return, Peck promised to assign to the company any inventions he might develop in connection with such a job. The contract did not reflect any such promises, but simply specified that Peck was “to devote his time to the development of a process and machinery for the production of the front spring now used on the product of the Ford Motor Company.” The Hess-Pontiac company was to pay him $300 per month plus a bonus of $100 per month if the process and machinery were completed within four months of the commencement of employment and an additional bonus of $10 for each percent in reduction of labor costs achieved through use of the invention. Peck returned to work for Hess-Pontiac for less than two years, and during that time he devised and built several machines for the company. He was paid for his work and a $660 bonus according to the contract. During his employment, Peck sought and received some patents for the machines.

Some years later, upon learning that a machine incorporating his patent was in use at the Standard Parts Company in Cleveland, Peck filed suit for patent infringement. Before the suit was filed, lawyers for Standard Parts had demanded that Peck provide all the drawings he had made while designing and building the machinery, and Peck had refused. Peck conceded that the drawings of the machines and the machines themselves were the work for which he had been paid and which his former employer owned, but insisted that the patents were his. Standard Parts, however, demanded the patent as well. When Peck sued, Standard Parts counterclaimed to get the patent, claiming that it had acquired all the assets of the Hess companies, including the Peck patent.

As he prepared his case, Peck focused considerable effort on showing that he was not hired to invent a specific thing but was hired generally to improve the spring manufacturing process, emphasizing that “the patent in suit was only one of at least eleven separate and distinct types of machines, and for as many separate and distinct purposes, that were built under the same contract.” Peck evidently hoped to fit himself within the cases, such as the Supreme Court’s decision in Hapgood v. Hewitt (1886), which had held that an employee hired generally owned the patents for his inventions and that only when an employee was hired to invent a specific thing was the employer entitled to the patent. Peck’s strategy was sensible because, at the time, it was not clear whether a specific oral or written agreement that the employee would assign inventions to the firm was necessary. Some insisted that a specific assignment contract was necessary, while others insisted that the assignment was implied by law.

The district court found that Peck “was not employed generally in a certain line of work” whose invention was simply incidental to his job; rather,
“[h]e was employed and paid to develop a process or machinery or means of accomplishing a prescribed result.” The court held that Pontiac owned the patent by virtue of the hiring to invent, and that Standard Parts Company, which acquired all of Pontiac's assets, had acquired the patents both to the manufacturing process and to the machinery. In the view of the district judge, Peck had "sold in advance whatever rights as an individual he may have had in and to his inventive powers, so far as they relate to the work he was to do or the results which he accomplished."  

The Sixth Circuit did not think “the settled law” allowed such a broad right of employer ownership of employee innovation. It read prior cases to establish that “an invention does not belong to the employer, merely by virtue of an employment contract, as well when that employment is to devise or improve a specific thing, as when the employment is to devise improvements generally in the line of the employer's business.” In the Sixth Circuit's view, “If one is hired in a general supervising or advisory capacity . . . and it is expressly understood that he is to devote his talents and skill to making improvements . . . there would be strong ethical grounds for saying that the invention belonged to the employer, just as did the other fruits of the labor and skill which had been bought and paid for."  

But the court could not bring itself to find a legal rule in that ethical obligation.  

The Supreme Court reversed, and held Standard Parts entitled to the patent. The Court rejected the Sixth Circuit's narrow reading of the kinds of contract required to transfer patent rights from employee to employer. “It cannot be contended that the invention of a specific thing cannot be made the subject of a bargain and pass in execution of it.” The Court found such a bargain in Peck's contract. The opinion reads as if the Court were simply distinguishing the older cases on facts: Peck's contract was solely to invent and the earlier contracts were to improve a business generally, including by inventing. But since the allegations in earlier cases, such as Hapgood v. Hewitt (1886), included that the employees were to “improve and perfect” the employer's technology and that they had been hired because of experience in “devising and getting up the best plows” (in Hapgood) and in developing “valuable improvements” to the employer's technology, it is a bit difficult to say that employees like Peck, Hewitt, and others had not been hired to invent. So it must be that an employee hired to invent and to manage was materially different than an employee hired only to invent.  

The distinction leaves something to be desired as a matter of logic, but as a matter of a broad characterization of the different statuses of employees, the Supreme Court’s view of the employer's rights in Standard Parts is quite revealing. An employee-inventor's product is the property “of him who

*Corporate Management of Science*
engaged the services and paid for them" just as is the product of any other worker. It is "a provision for a business, a facility in it and an asset of it." 30

The aspect of Peck's case that seemed to bother the Court the most was Standard Parts' averment in its counterclaim that Peck had licensed the patent to companies in competition with his former employer and had allowed the competitors to use his drawings of the machines, "notwithstanding the fact that said drawings were made by this plaintiff, or under his supervision, at the expense of defendant's predecessors." 31 Employee ownership of the invention would "subject the company to the rivalry of competitors" and would enable him to "give as great a right to any member of the mechanical world as to the one who engaged and paid him—a right to be used in competition with the one who engaged him and paid him." 32 In other words, Peck asked the Court to imagine him as an entrepreneur. The Court would not. In choosing between two visions of the inventive employee, the Court rejected the view that allowed the employee to compete, adopting instead the view that an employer who has bought the employee's service is entitled to absolute control of all the products of it.

The result and rule in Standard Parts facilitated the bureaucratization of invention by eliminating the need for employers expressly to contract with inventive employees regarding ownership of patents. Invention, like all other inputs to production, could be standardized and the firm would own all the products of the inventive employee, just as it owns the products of other forms of labor. As it happened, the invention at issue in the case was itself a product of Henry Ford's famous desire to reduce costs by standardizing parts and investing in mechanization (even though he was willing to pay much higher labor costs per hour/day than most manufacturers were then). 33 Perhaps not coincidentally, both the facts of the case and the Court's holding are manifestations of the same impulse toward modernization. Efficiency can be gained by substituting mechanization and standardization for handmade parts and idiosyncratic processes. The Court's new view of employee Ingenuity as a service that can be standardized and commodified and should be assumed to be an asset of the business appears to flow seamlessly from the context of the case—mass producers sought technology that would standardize their operations, and the production of that technology could itself be standardized.

Standardization of invention, however, required legal rules that treated invention like any other input into production—including labor and materials—and made all of them the property of the firm without the necessity for individual contract negotiations. If ownership of intellectual property turned on individual negotiations, there would be the risk that individual
employees could negotiate to own their intellectual property, or, even worse, a court might conclude that an inventor had done so when the company had been under the impression that it owned the patent. The standardization of innovation thus both required and enabled employee inventiveness to be treated like a commodity, which in turn depended upon a divorce of invention from entrepreneurship. To do all that, the Court collapsed what had been a large difference between the rights of the inventive employee and those of the laborer. Henceforward, both would be assumed to transfer, through a contract of employment, all the products of their time and effort. The new legal rules both built on and contributed to a new view of inventive employees as servants rather than as entrepreneurs, as parts of a corporate R & D hierarchy rather than as independent inventors. The Supreme Court eventually held in another case in 1933 that the employer’s financial support of the employee, via payment of salary, was an investment in the technology and the basis for employer’s contractual right to use the employee’s patent. “Since the servant uses his master’s time, facilities and materials to attain a concrete result, the latter is in equity entitled to use that which embodies his own property.”

Courts resorted to the legal fiction of implied contract to effect this change because fictitious consent was the only way to justify such a profound assault on the independence that was foundational to the postbellum free-labor ideology. The arguments for employer ownership in Hapgood seem quite compelling—he was, after all, hired to improve the company’s plow business and designing a new plow would seem squarely within what he was hired to do. Yet the arguments for employee ownership seem equally compelling. The desire to create, and to control one’s creations, is perhaps innate. Prospects for upward mobility and entrepreneurship were at the core of the late nineteenth-century understanding of free labor and, indeed, of freedom itself. The fiction that the parties agreed that the employee in Hapgood or the employer in Standard Parts should own the invention allows the court to achieve an intuitively appealing result without stating a rule broader than necessary in a context in which an obviously broad rule favoring employer or employee would be troubling. The fiction of free consent had particular emotive force in the context of the free-labor ideology; and the rule and result were intellectually satisfying for, without involving the obvious creation of new doctrine of uncertain breadth, it achieved the intuitively appealing result.

That the intuitively appealing result changed from one rule to its exact opposite over the course of a generation or two reflects the increasing acceptance of a middle class dependent on corporate employment as being

*Corporate Management of Science*
consistent with rather than a threat to the notion of free labor. In the 1880s, the possibility of economic and social advancement through entrepreneurship was understood to be the hallmark of middle-class respectability. In the nineteenth century, young male office clerks and manual workers trained to become small business proprietors through their work experience, not primarily through education. By 1925, formal education followed by stable employment at a growing corporation had increasingly supplanted entrepreneurship as the path to middle-class status. Translated into the contract terms favored by the courts, an implied term of the nineteenth-century employment agreement was the possibility of entrepreneurship as the reward for creativity and hard work. An implied term of the mid-twentieth-century employment agreement was stable employment and upward mobility through the firm as the reward for the same qualities.

The Use of Trade Secrets and Employment Contracts at Eastman Kodak

One of the important cases in the development of the law of corporate ownership of workplace knowledge was Eastman Co. v. Reichenbach (1892), a dispute between the Eastman photography company and its first research chemist. The chemist had signed an express contract requiring him to assign inventions made in the course of his employment to the company. He and others started a competing business using secret processes they had been involved in developing while employed by Eastman. The company deemed this a misappropriation of its investment in research and product development, and the court agreed.

In this and other cases about trade secrets and restrictive covenants, Eastman (which later became Eastman Kodak, and finally just Kodak, because of the phenomenal success of the Kodak trademark) played a significant role in urging courts to adopt a view of workplace knowledge that equated a firm’s investment in the development of technology with the firm’s entitlement to own it. Early twentieth-century advances in corporate research and development enabled employers like Eastman Kodak to argue convincingly that enforcement of restrictive covenants was essential to protect their investment in a wide variety of secret knowledge. Eastman Kodak was a particularly zealous advocate of the view, new at the cusp of the twentieth century, that firms, rather than individuals, were pioneers of new technology and that firms hired employees for their knowledge rather than just their labor. The firm was a leader in industrial research and development and a vigorous advocate of company ownership of employee innovation. As a significant investor in research, the company aggressively protected company secrets
while trying also to motivate research employees by allowing them to believe that their work for the company was genuine science. George Eastman's attention to patent matters, and to intellectual property rights generally, is legendary. "The ideal large corporation," he was quoted as saying, "is the one that makes the best use of the brains within it." The aggressive use of emerging intellectual property law combined with the aggressive effort to develop new technologies makes the company an excellent case study of how a combined legal and R & D strategy transformed both the law and the practice of corporate control of workplace knowledge.

George Eastman patented the first usable photographic film, which consisted of a nitrocellulose solution on paper backing that was stripped off after the film was developed. After patenting the new film in March 1884, Eastman developed a roll holder to be used with spools of film, which was far more convenient than the heavy and fragile glass plates that photographers had previously used. Eastman energetically promoted his new invention, incorporating the Eastman Dry Plate and Film Company on October 1, 1884, and using letters, advertisements, and demonstrations to educate photographers about the new product. He designed machinery to manufacture the film and began production on March 26, 1885.38

In August 1886, Eastman hired Henry M. Reichenbach, an assistant to a respected chemist at the University of Rochester, to help him develop a better film while he advanced the business. Eastman was among the earliest American manufacturers to employ a full-time research chemist. Reichenbach was a skilled chemist but relied on Eastman for the necessary knowledge of photography. He worked full time testing ideas, often those suggested by Eastman. Many of Reichenbach's developments were in the area of emulsions, the chemical solutions coating the film. Emulsion formulae were crucial to success in the photographic trade, so Eastman guarded them fiercely as trade secrets, on one occasion sending his business partner a sample of one of Reichenbach's early emulsion experiments instead of a recipe.39

After two years of experimentation, Reichenbach invented a flexible film that did not require a paper backing. Eastman, meanwhile, had developed machinery for manufacturing Reichenbach's new film. Eastman instructed his patent attorneys to put the patent for the chemical process in Reichenbach's name and the mechanical processes in Eastman's own name, writing that "I should like very much to have Reichenbach's name connected with these applications and think it would please him." Patents were granted to both men. Eastman began selling the new film on August 27, 1889. Eastman reincorporated the business as the Eastman Company in late 1889. Reichenbach received fifty shares of company stock in exchange for agreeing that the
company would own all the photographic inventions he produced during his employment with Eastman. 40

On January 1, 1892, Eastman fired Reichenbach after discovering that Reichenbach and two other employees had formed a competing film company. One of these employees, S. Carl Passavant, was an analytical chemist whom Eastman had hired to assist Reichenbach when he became manager of Eastman’s new film factory in Greece, New York. The other was Gus Milburn, a traveling salesman. Reichenbach had also attempted to recruit the manager of Eastman’s film factory in Harrow, England. The dispute was evidently personal and bitter. Eastman’s biographer said that Eastman had been quite fond of Reichenbach, considered him the “heir apparent” of the firm and “the future of photography.” For his part, Reichenbach evidently was sufficiently angry at Eastman to sabotage some company supplies before leaving the firm. 41

Eastman sought and received an injunction in the New York Supreme Court to stop Reichenbach, Passavant, and Milburn from using or disclosing any of the trade secrets they had taken from the company. Identifying two strands in the past decisions in the field, the trial judge deduced that “some are made to depend upon a breach of an express contract between the parties,” while others rested on “the theory that, where a confidential relation exists between two or more parties engaged in a business venture, the law raises an implied contract between them” and that use or disclosure of such secrets “is a breach of trust and a violation of good morals, to prevent which a court of equity should intervene.”

The court found that both lines of reasoning justified an injunction. Reichenbach and Passavant had been paid a salary to perform chemical research, and “under the terms of their employment, and by the strict letter of their contract,” Eastman was entitled to the exclusive benefit of their discoveries. The defendants had clearly been aware of the value of these formulae and processes, since they had during their employment helped Eastman to keep them secret from the public and even from their coworkers. As the judge explained, Eastman had proved that “men employed in one department were not allowed to go into another department. Ingredients employed in compounding certain mixtures were guarded by lock and key, and various formulae were only given to those whose business it was to use them.” 42

Eastman hired other chemists to replace Reichenbach and Passavant. Meanwhile, Reichenbach and his associates sold their Eastman stock and raised money from investors to found the Photo Materials Company. Not to be outmaneuvered, Eastman worked to make sure its contracting part-
ners remained loyal to Eastman rather than the new competitor. Eventually Reichenbach's venture failed, and Eastman bought what remained of the company cheap in order to get its land and machinery. Reichenbach meanwhile had left Photo Materials in 1897 to form Reichenbach, Morey & Will, which Eastman sued for patent infringement. Eventually, that business also failed. Reichenbach and Milburn at different times sought to return to the Eastman Company, but Eastman would not hire them back.\footnote{43}

Not content to rely solely on secrecy, the Eastman Company began including noncompetition clauses in employee contracts to prevent former employees from working in the photographic industry for up to twenty years.\footnote{44} In addition, regardless of the existence of noncompetition agreements, the company asserted in litigation that the existence of a trade secret should be a sufficient basis for prohibiting a former employee from working for competitors (not merely from revealing the secrets, as earlier cases had suggested).

Although Eastman Kodak was a jealous protector of its own secrets, the firm was an avid consumer of technological knowledge it could find elsewhere. Eastman himself took advantage of opportunities to gain access to competitors' information. He hired his former photography teacher George Monroe to supervise emulsion-making because Monroe had experience in certain St. Louis factories that produced better emulsions than the Eastman Company could make. However, he fired Monroe when he became dissatisfied with his performance and became concerned about Monroe's ability or willingness to keep secrets.\footnote{45}

A dispute between Eastman and a distributor-turned-competitor shows the challenge that Eastman faced in protecting what the firm considered its trade secrets. The Anthony Company, in business since 1841, dominated the trade in photographic supplies. The Anthony Company had been a distributor of Eastman products since 1880, but Eastman terminated the contract in March 1885 because Eastman had developed its own sales force. In July 1885, Eastman began machine-producing photographic paper, creating a higher-quality product while using substantially less labor and materials than the hand-coating method used in the Anthony factories. In January 1887, Eastman discovered that Anthony had hired away two valued employees, Franklin Millard Cossitt, the foreman in charge of papermaking, and David Cooper, a traveling salesman. Cossitt was helping Anthony to set up a papermaking machine just like Eastman's, while Cooper was laying the foundations for Anthony to sell the new paper.\footnote{46}

Eastman sent spies to speak with the employees and may even have sneaked into the plant himself to find evidence that Anthony was infringing the patent for his machinery. He brought suit in March 1887, but Anthony

*Corporate Management of Science*
claimed that they had stopped using the machine as soon as they learned of Eastman’s patent. Therefore, the judge denied Eastman a preliminary injunction but required Anthony to stipulate that they would not use the machine or allow it to leave their possession until a final hearing. No final hearing ever occurred, but Anthony fired Cooper and Cossitt and never used the machine.47

Eastman and a few other photographic companies controlled the secrets to emulsion technology, and Eastman recognized that technical superiority was crucial to its ability to stave off competition from other firms in the 1890s. “If we can get out improved goods every year,” Eastman wrote, “nobody will be able to follow or compete with us.”48

Eastman Kodak founded a research laboratory in 1913 to do basic scientific research shortly after Eastman visited the German research facility of Friedrich Bayer & Company, which had employed university-trained chemists to develop new dyes since the 1870s and which by the 1890s was a well-established industrial research laboratory that did not exist in American businesses until after the turn of the century.49 Dr. C. E. Kenneth Mees, the first director of the Eastman research laboratory, told George Eastman from the beginning that no commercially valuable innovations were likely to be produced in the first ten years. The purpose of the laboratory was to establish the company’s prestige as an innovator and to produce work that would protect the company’s technological dominance over the long run.50

With the founding of a research lab and the desire to recruit and retain scientists, company officials realized that a balance had to be maintained between the corporate culture of secrecy and the scientific ethos of sharing and publication. Eastman Kodak managers and lawyers allowed research laboratory employees to publish results of their scientific work, both because the laboratory’s work was not usually on products that were immediately profitable and as a way of motivating employees to stay current in their fields and to complete research projects in preparation for publication. As Mees explained in one of a pair of articles on industrial scientific research that he published in the journal Nature three years after the founding of the research lab:

When the men come to the laboratory they are usually interested chiefly in the progress of pure science, but they rapidly become absorbed in the special problems presented to them, and, without definite effort on the part of those responsible for the direction of the laboratory, there is great danger that they will not keep up to date in what is being done by other workers in their own and allied fields.
Their interest can be stimulated by journal meetings and scientific conferences, but the greatest stimulation is afforded by the requirement that they themselves should publish in the usual scientific journals the scientific results which they may obtain.\textsuperscript{51}

Eastman Kodak’s original agreement with Mees specified that the laboratory “will be allowed to publish the results of scientific investigations where they do not interfere commercially with the business” provided that before submitting research for publication it was “always submitted to and approved by the Company.”\textsuperscript{52} The first published paper, a “purely mathematical consideration of photographic density,” appeared in \textit{Philosophical Magazine} in 1913; by 1925, over 240 papers and other items from the research laboratory had been published.\textsuperscript{53}

In Mees’s view, companies owed an obligation to science to publish the results of purely scientific work but owed no obligation to publish the results of their efforts to improve manufacturing technology. “Technology is the art of making things. It deals with the methods used for production,” which a company could properly keep secret because technology “is of value only to other firms who use that particular technology.” “Scientific advances,” on the other hand, “must be published even when they are applicable to technology because science advances as a whole, and any attempt to withhold the publication of scientific work reacts to the disadvantage of the withholder. Moreover, scientific men will not continue to do satisfactory work unless they can publish that work and feel they are taking part in the advancement of science.”\textsuperscript{54} The challenge, of course, was to distinguish science from technology.

Although the company guarded secrets from outsiders, information within the laboratory was not restricted. Mees encouraged researchers to discuss their work with each other by developing a “conference” system in which researchers met informally each morning to discuss a particular area of research. Sometimes Eastman Kodak employees who were not research lab employees attended these conferences. Mees explained that the conference “procedure will enable a great saving in time to be made, since it will avoid the loss of time which continually occurs in laboratories from the wrong man doing a specific piece of work.” Mees also insisted that the research division “building should be so arranged that all the laboratories are open to everybody in the scientific departments” so that researchers would have access to all the apparatus that they needed.\textsuperscript{55}

Nevertheless, the company remained extremely secretive about technologies it considered its competitive advantage. No employee could communi-

\textit{Corporate Management of Science}
cate an emulsion formula or other trade secret formula to another, regardless of who he was, without advance written permission by George Eastman.\textsuperscript{56} Interestingly, Eastman sometimes even had to use such letters to force his employees to share information. William G. Stuber, Eastman's master emulsion maker, was said to guard his formulae so carefully that he was affronted even by a 1912 letter from Eastman stating: "You are hereby authorized and requested to impart to Dr. C. E. Kenneth Mees, as desired by him, any formulae in your possession."\textsuperscript{57}

Eastman Kodak figured out that if emerging trade secret and noncompetition law prevented recruiting employees with the technical knowledge it wanted, it could simply purchase the competitor companies that employed the knowledgeable people and gain the information that way. In 1898, the Standard Dry Plate Company hired chemist Milton B. Punnett away from the M.A. Seed Company in order to obtain his knowledge of M.A. Seed's dry plate production methods and emulsion formulae. Standard's market performance greatly improved as a result, but strife within the company led Punnett to approach Eastman. In the spring of 1902, Eastman bought Standard Dry Plate and signed an employment agreement with Punnett. The emulsion formula Eastman thus obtained required much less silver nitrate than Eastman had previously been using, thereby saving double Eastman's purchase cost in just one year. Eastman then purchased M.A. Seed to get its emulsions formula as well, with additional agreements for certain key employees to come to Eastman. Finally, in 1904, Eastman bought the Stanley Dry Plate Company when he heard that it had obtained Standard's emulsion formula. Eastman also bought the Artura Paper Manufacturing Company after discovering that buying Artura's emulsion-making formula was not enough; Eastman needed access to Artura's secret manufacturing method. The practice of technology acquisition by corporate acquisition succeeded. In a letter of 1908, Eastman wrote: "In the last few years we have developed a scheme for making dry plates by combining all the improvements that we have found in the different factories we have bought, that is well nigh perfect."\textsuperscript{58}

Although the company fought vigorously against Reichenbach's competitive employment in the 1890s, by the early 1900s Eastman showed little concern about an executive's threats to resign: "There are so many things required in order to make a success in this day in the photographic manufacturing business that the company is not greatly alarmed at what any man can do. All of our big competitors to-day can make good emulsions, some of them can make mighty good film; . . . some of them have been in business
longer than the Kodak Company and people have left the Kodak Company
to go into business, but with very few successes even when they started with
conditions much more favorable than they are now." Eastman Kodak may
have held on to some of its emulsion secrets even after the 1921 antitrust
decision against it, when no auction bids were placed for its dry plate busi-
nesses and Eastman Kodak manufactured the plates for the company who
eventually bought the dry plate brands.

The legal regime governing employee innovation that had come into exis-
tence over the forty years of Eastman's aggressive business and litigation
practices enabled Kodak and other firms in the 1920s to enjoy control over
employees and their knowledge that would have been impossible in the
past. In Eastman Kodak Co. v. Powers Film Products, Inc. (1919), for example,
Eastman Kodak obtained enforcement of a two-year restrictive covenant
against a former employee who had worked as a chemist. After describing
the company's extensive research into film manufacturing and the defendant
employee's long tenure with the company as a research chemist, the court
justified the restriction on the ground that "the value of Warren's services
to the defendant company arises from his experience while in the plaintiff's
employ, growing out of the practical application of these trade secrets, and
not otherwise." In the court's view, the employee acquired "special know-
ledge" through his exposure to the "secret processes" of the company. The
court justified the extraordinary remedy of prohibiting the chemist from
working in the film business on the ground that a narrower prohibition on
simply using Kodak trade secrets "is more than likely to prove inefficient.
The mere rendition of the service along the lines of his training would almost
necessarily impart such knowledge to some degree. Warren cannot be loyal
both to his promise to his former employer and to his new obligations to the
defendant company."  

By the mid-1920s, the company had not only expanded its own control
over employee knowledge through the careful use of contracts and care-
ful guarding of information, but had played a crucial role in litigating the
cases and articulating the legal theories that brought about legal change that
enabled other employers to do the same. The expansion of the trade secret
concept that Eastman Kodak urged in cases from Reichenbach in 1892 down
to Powers in 1919 fueled a corresponding growth in the possible uses of re-
strictive covenants, which the company also was well positioned to benefit
from, as it had for years been using restrictive covenants to prevent departing
employees from working in the photographic supply business. The company
was a beneficiary not only of its own business success but also of its own legal

*Corporate Management of Science*
success, as its campaign of legal change created new ways that the company could control employee mobility and prevent the diffusion of knowledge it regarded as proprietary.

_Discontented Entrepreneurs in Knowledge Factories_

The shift to managerial capitalism and its impact on employees involved in innovation was as significant at E. I. du Pont de Nemours & Company as it had been at Eastman Kodak. Whereas with Eastman Kodak, we see the story from the top-down perspective of the company president and externally from the perspective of the courts, at Du Pont we see the story from the bottom-up perspective of a company chemist and from the inside perspective of company lawyers and senior managers. An episode from the Du Pont research lab that led to the U.S. Supreme Court deciding its first trade secrets case illustrates how a feared loss of status by a corporate scientist led him to hang onto the right to control his knowledge, and to litigate it zealously even when the litigation seemed to have benefited neither him nor Du Pont. The dispute became as much about power and status as it was about access to valuable knowledge.

Throughout the nineteenth century, Du Pont had been a family-controlled manufacturer of gunpowder and explosives. In 1902, three du Pont cousins gained control of the company and instituted a massive reorganization. All three were trained as engineers and were familiar with the advanced administrative practices used by the railroads and in the steel, electrical, and machinery industries. They decided to abandon the old structure of the firm, which had been a small family-controlled company that worked closely with a number of other small family firms to control the explosives industry through horizontal combination. Instead, Du Pont became a large, vertically integrated, and centrally administered firm. As business historian Alfred Chandler explained, “Their aim was to dominate the industry by running the most efficient mills as fully and as steadily as possible and so to reduce their unit costs to levels that small competitors could not achieve.”

By 1910 Du Pont employed “nearly all the basic methods that are currently used in managing big business.”

As part of the massive reorganization in 1902, Du Pont started two research and development laboratories to systematize and centralize the research and innovation that had occurred in diverse parts of the company’s operations. As Du Pont became more systematic and bureaucratic about inventive activity, it became more bureaucratic in its employment practices regarding inventive employees. For example, in 1904, when the company began holding monthly meetings of all the superintendents of its dynamite
plants in the Wilmington area, the superintendents formulated common policies on a number of personnel issues, including searching employees for matches (an obvious threat in a dynamite factory), design and adoption of uniforms for all plant workers, installation of time clocks, and tabulation of labor costs and comparative yields. Although there was no discussion in those meetings of employee-generated intellectual property, in the same year Du Pont for the first time formally asserted ownership of its employees’ patents. It began to require some employees working at the labs in an inventive capacity to sign employment agreements which acknowledged that “any inventions, improvements, or useful processes relating to explosives, their ingredients, manufacture or use, or to the appliances or machinery connected therewith, or to the treatment of by-products thereof” that the employee might make while in Du Pont’s employ “shall be the sole and exclusive property” of the company. But the questions of which employees should be required to sign such a contract, which inventions the company ought to claim, how the company should assert its claims, and what to do if employees refused were not resolved then or for years to come.

Personal relationships may have affected whether employees could successfully negotiate out of the patent assignment policy. Ernest du Pont, for example, signed a patent assignment contract when he took a job with the company in 1906. He left the firm in 1908, and two years after he returned in 1911 he insisted that the contract he previously signed was no longer in force because he was “re-employed by the company in an entirely different capacity, and at a lower rate of salary than I was getting when I signed the agreement.” The company readily agreed. The records do not reflect whether similar individual arrangements were ever made for employees who were not du Ponts.

Du Pont dealt with trade secrets by policy rather than by express contract. In 1908, the company sent a notice to all the employees in the smokeless powder plants and posted the same notice in the research laboratories and the dynamite plants. The notices advised employees that Du Pont “owns and possesses the right to use . . . secret processes . . . in connection with the manufacture of explosives and the appliances, packages, material, machinery, and other things relating to said business and used in connection therewith.” It warned the employees sternly that it is “illegal for you during your employment or after its termination to reveal to any person, other than those in the employ of the company whose business it is to know . . . any information or matter whatsoever relating to the said secret processes, compositions, reagents, apparatus and machines.” The warning went further: “It is also illegal during your employment, or after its termination, to use or

Corporate Management of Science
employ any of the said processes, alone or in conjunction with others, except for the Company while in its employ." After the stern admonitions about the law, however, the notice concluded plaintively: "The company appreciates the high degree of loyalty and sense of right that has maintained with its employees during the many years it has been engaged in business and feels that calling attention in this way to the legal status of secret processes is all that is necessary."

In 1911, Du Pont again reorganized its operations, moving chemical research from the development department into a department of its own, called the Chemical Department. In February of that year, perhaps as part of that reorganization, the Executive Committee appointed J. Amory Haskell and Arthur Moxham as a subcommittee to study and report on the question of whether employees should be made to sign a contract obligating them to assign to the company the rights to inventions they might develop. The Executive Committee did not consider the 1904 contract to go far enough. So the subcommittee reconsidered what sorts of patents by which employees should be company property.

Moxham had proved his managerial ability to the du Ponts in his management of a Johnstown, Pennsylvania, streetcar rail manufacturing company. Pierre du Pont described him as "a master of cost sheets and orderly management." In 1895, Moxham had hired Frederick Winslow Taylor to reorganize the streetcar rail company's operations. Taylor's methods made a big impression on Moxham and the du Ponts, and when Moxham went to Du Pont after the 1902 reorganization, he brought with him Taylor's costing and control methods, which Moxham learned at Lorain Steel, a plant for which Taylor had consulted in that era. Moxham came to Du Pont determined to rationalize its processes and saw revision of employee invention assignment policy as part of his mission.

The subcommittee of Moxham and Haskell concluded that, with respect to ownership of patents, Du Pont needed separate policies for two classes of employees. "Class 1" included "those employed in the original research laboratories," and they should be obligated to sign contracts assigning inventions. Class 2 encompassed unspecified other employees. The report went on: "[W]e do not believe it is wise to disturb the minds of our employees by adopting the cast iron rule that all salaried employees regardless of the nature of their employment should be expected to sign a contract." The committee evidently did not consider how nonsalaried employees would fit into the structure; they must have assumed that hourly employees were unlikely to innovate. Among Class 2 employees, the report suggested that only those "the nature of whose work makes it likely that they will be or might be
contributors towards inventions or secret processes" should be expected to sign a contract assigning inventions. For Class 2 as well as Class 1, "all secret processes which are evolved out of the natural developments from the Company’s business should be given without reservation to the Company." The subcommittee recommended that it be left to the heads of departments to decide which employees fell into Classes 1 or 2 and which employees should not be asked to sign either contract. "By this means a method is left to relieve the Company from embarrassment if called upon to decide between insisting upon the signing of a contract, or, as an alternative, upon the discharge of an employee refusing to sign."

The two members of the subcommittee disagreed about how far the company should go in claiming employee inventions. One believed that the company should claim all rights to all employee inventions, regardless of the subject matter or the circumstances in which the employee created it. The other thought that, for inventions that could be applied to industries other than those in which Du Pont was engaged, or an industry "in which the Company represents a small or minority interest," Du Pont should obtain an exclusive license "for the purpose of making explosives only, and that everything else should belong to the inventor." Perhaps Moxham was the skeptic, as he himself had helped to invent a new steel rail before going to work for Du Pont. But both agreed that the company should demand by contract more rights to employee inventions than the default rule would allow. For example, although then as now companies were not entitled to any rights in employee inventions made without use of company time or resources, the subcommittee insisted that "in the case of inventions not made in the Company’s time or developed by use of the Company’s money, the company should be given a general shop right or ordinary license to manufacture."

The Executive Committee debated the merits of the proposals but was unable to decide what to do and referred the matter to another subcommittee "for further consideration and report." But the matter of what to do about employee contracts lingered on the Executive Committee’s unfinished business agenda for at least the next three years. As late as 1914, Hamilton Barksdale, Du Pont’s general manager, received a memo from the Executive Committee asking him to consider and report on what the company should do regarding employee contracts covering inventions. Barksdale’s inattention was not due to his disinterest in details; indeed, some Du Pont senior management considered him too detail-oriented.

After a few years, Du Pont did adopt a policy of requiring all employees working in the labs, not only chemists and engineers, but also clerks, stenographers, and other clerical employees, to sign contracts conveying to
the company all rights in all patents and other inventions. And, as Du Pont diversified from explosives into other industries such as artificial leather and cellulose by-products, they revised their employment agreements to expand the range of intellectual property that the company claimed.27

Du Pont’s reputation for enjoining secrecy upon its employees circulated to others in the industry. An official of U.S. Rubber, having heard that in Du Pont laboratories “even the stenographers and office boys” were “under confidential contract,” asked for a copy of the Du Pont contract. As the U.S. Rubber official put it, “We have at present chiefly one form, which is rather extreme, excepting for technically trained men who can see a real future in the business, and we need a simpler form for others who should realize the importance of keeping information to themselves.” Du Pont obligingly sent them a copy of the Du Pont contract used for “all salaried employees of the Chemical Department, including the research laboratories.”28

As the company exerted greater control over the processes and results of innovation, it struggled to develop methods to motivate salaried employees to exert the utmost effort to invent, and to induce them not to take their valuable knowledge to jobs with competitors. Financial incentives were thought to be a solution, but it proved difficult to maintain the perfect system. Shortly after the 1902 reorganization, the Executive Committee began to consider ways to enlist the loyalty of managers now that they could no longer assume the personal and financial commitment that had come from family ownership and management of the firm. It was eventually as a part of this incentive system that the company began compensating employees for patents. In 1902, Coleman du Pont, the company president, asked the firm’s local lawyer to draw up plans to permit “important employees” to purchase stock in the new firm. At that point, employee stock ownership was quite novel, although other firms began to adopt such programs at the same time. They set up one stock bonus plan in 1904 and another in 1906 to reward “merit.” The stock bonus plan eventually was revised to include bonuses for patents. In the summer of 1912, Arthur Moxham, ever the imaginative one among Du Pont high-level managers, saw an article in The Iron Age describing a plan of the National Metal Trades Association for compensating employees for patents. Barksdale was quite interested and arranged to get a copy of the plan. Eventually, Du Pont adopted a system of compensating employees in Du Pont stock for patents, although employees complained that they were restricted from selling the stock and the dividends alone made the compensation plan unsatisfactory.29

Some Du Pont managers remained concerned about the fairness and desirability of allowing too little financial reward to inventive employees. For
example, one Dr. Weedon, an employee of Du Pont's Chemical Department, invented a fluorescent screen. Shortly before Weedon died, he assigned the patent to Du Pont. The invention required further developmental work to make it commercially successful, and the work was done in the Du Pont lab. Hamilton Barksdale recommended, and the Manufacturing and Sales Committee approved, that, after the Chemical Department determined whether the invention could be developed for commercial sale, "consideration shall be given as to whether or not any portion of the profits derived therefrom shall be turned over to Dr. Weedon's Estate." It is unclear whether any profits were ever paid. Some companies, however, abandoned the practice of paying bonuses to employees for patents; after 1912, Bell Labs ceased its practice of paying $100 for each new patent because the research director thought the bonuses fostered destructive individual effort rather than the cooperative spirit that Bell Labs deemed most productive for maximal inventions by the corporation as a whole.

The commodification of R & D, and of the people who did it, did not pass unnoticed in the labs. The managers' insistence that the scientists and engineers were working for a salary and that all their output—things, patents, processes, or ideas—were the company's property elicited some dissatisfaction among the employees in the Chemical Department. The story of Walter Masland, a Du Pont research chemist who left the firm to work in his family carpet manufacturing and textile business, illustrates how one highly educated employee who sought to be an entrepreneur chafed under the regime of corporate control. It may not be unique, but it is particularly well documented because his dispute with Du Pont over whether his knowledge of cellulose was a trade secret was litigated all the way to the Supreme Court. Rhetoric about a need for the law to protect the employer's investments in process or product development combined with the loose treatment of contractual obligations was particularly useful to Du Pont's efforts to prevent Masland from using alleged company trade secrets for manufacturing artificial leather.

Masland went to work for Du Pont in 1904 after studying chemistry at the University of Pennsylvania. Masland obtained a number of patents during his ten-year employment at Du Pont, and he assigned all of them to the company pursuant to the form contract he signed in 1904. In 1914, Du Pont's work on artificial leather reached the point that the company was planning to build a plant to manufacture it for commercial sale. Du Pont acquired a monopoly (and a trademark brand) by acquiring a New York–based artificial leather company, Fabrikoid. Masland hoped to be promoted when Fabrikoid's assistant superintendent—chief chemist quit, but he was instead expected...
to pick up his work without a promotion or a raise. Feeling underpaid and unappreciated as others were promoted over him, Masland quit. Masland was not alone in feeling exploited; some of the younger chemists complained that Charles Reese, the head of Du Pont's Chemical Department and chair of its Experimental Board, patented subordinates' work in his own name and displayed "intolerance and haughtiness in his manner." Masland complained to Reese that Du Pont often passed over for promotion men with talent in favor of men with family connections. As a consequence, he complained, men at the Experimental Station had few opportunities for promotion.83

Reese tried to persuade Masland that morality and loyalty to Du Pont should dissuade him from going into the artificial leather business with his family firm. According to Reese, Masland replied that "he had given the matter of his moral obligations a great deal of thought; that he did not believe he had a moral right to sell or give this confidential information to competitors, or to other parties." But, according to Reese, Masland did believe "that he had the right to use personally any information, confidential or otherwise, which he had obtained either through his own effort or efforts of others during his employment with the company."84 This characterization of Masland's belief—that he had a right to use knowledge that he had participated in developing—reflected an issue that had vexed trade secret law for thirty years. Masland's own work and intelligence had produced the advances in the chemistry of artificial leather, and in his view he sought merely to use the knowledge he had developed over the course of his career. In Du Pont's view, however, because he had been paid to develop that knowledge and Du Pont wanted to keep the results of the research for itself, he was both morally and legally obligated to give Du Pont the exclusive use of his knowledge of artificial leather. In the ensuing litigation, Masland never claimed that he had the right to use secret knowledge so long as he had participated in developing it; his theory was that the chemistry of artificial leather that he planned to use was common knowledge among chemists familiar with cellulose and artificial leather.

The company's aggressive position regarding employee intellectual property prompted a series of discussions between its chemists and lawyers about the threat that employee mobility posed to company intellectual property. After Masland announced his intentions but before he left the firm, the lawyers and company officials met and, according to notes taken by company patent lawyer Edwin Prindle, they agreed among themselves that "the moral questions involved group themselves under two heads." First, there was "an implied contract between the Company and Mr. Masland that he would not make use in any way of any confidential matters concerning the Company.
and its work." Second, according to Prindle, Masland’s “proposed line of conduct places the Company under an unfair handicap in competing with him. The Company has spent large sums of money in perfecting the process under consideration. When its goods are placed on the market, therefore, it will have to charge enough for its product to cover the cost of its investigations. As Mr. Masland has borne none of this cost, he can sell at a lower price than the company, and destroy its market. If he thinks this is fair, his moral judgment is either very much atrophied or greatly warped.”

Du Pont sued him seeking an injunction against his using processes that Du Pont claimed to be trade secrets. Masland claimed they were, rather, common knowledge among chemists and insisted that he had developed his knowledge both before going to Du Pont and while working there and ought not be enjoined from using his accumulated chemical knowledge. The litigation never resolved that question. Rather, the litigation focused primarily on whether Masland could obtain expert testimony to establish that the process that Du Pont claimed as trade secret was in fact common knowledge among chemists of cellulose and artificial leather. Du Pont wanted to prevent Masland from drawing his experts from the ranks of their competitors, preferring that he serve as his own expert or that he use experts drawn from government or academia. Masland contended that all the experts whom Du Pont suggested either consulted for Du Pont or relied on Du Pont for business. The district court enjoined Masland from revealing Du Pont’s processes to expert witnesses, and it was that order that was appealed eventually all the way to the Supreme Court and left standing in a short opinion by Justice Holmes. The opinion stated essentially that the trial judge had discretion to determine whether disclosure of trade secrets to experts was necessary to the defense or whether it would suffice for him to disclose “whatever public facts were nearest to the alleged secrets.”

Prindle persuaded Du Pont officials to see their employment practices regarding patent assignment agreements as part of a deliberate competitive strategy. Prindle explained his ideas in a series of articles published in Engineering Magazine in 1906 and in a 1908 book, Patents as a Factor in Manufacturing. The avowed purpose of the book was to suggest to “manufacturers” the benefit of obtaining legal advice about patents to aid their business; no doubt the unstated purpose was to enhance his reputation (and presumably expand his business) as a lawyer. “There are many manufacturers who could and would strengthen their position commercially through patents, if they but saw the neglected material at hand, or understood the fuller possibilities of material.” The book contained a chapter on “the patent relations of employer and employee,” which formed the basis of Prindle’s advice to Du Pont

Corporate Management of Science
about the necessity of getting experimental employees to sign invention assignment agreements. As Prindle saw it, because patents may be issued only in the name of the inventor, for a corporation to gain an effective monopoly on a technology, "it is desirable to have a contract with every employee who is at all likely to make inventions which relate to the business of the employer." Recognizing that some employees would be reluctant to sign such contracts, particularly since they did not require additional consideration beyond the employee's regular salary, Prindle recommended that corporate leaders use "psychology" by signing the same contracts requested of employees. Contracts by officers, Prindle recognized, were "a mere matter of form, as [the corporate officer] is frequently a man who is either not inventive or one who is glad to take his returns in the form of dividends from the stock." Thus, Prindle recognized that patent assignment agreements would be perceived as rendering employees part of the dependent middle class, and proposed that the status effects be masked by corporate leaders signing the same agreement.

There was a reasonable basis for Prindle's concern that inventive employees might refuse to assign patents. Recent histories of company research in the 1880s and 1890s have uncovered examples of employees (one at Westinghouse and one at the Edison Machine Works) refusing to assign patents for inventions they had been hired to invent, and although there is no reason for these specific instances to have been familiar to Prindle, such stories no doubt circulated among company managers and lawyers. The recalcitrant inventors may have felt that hanging onto their patents was the only way to ensure that their creativity and hard work were credited and rewarded. Company lawyers recognized that the reluctance of the inventive employees may have been about status and self-respect as much as about money. The lawyers for Edison Machine Works, for example, explained that an invention "belongs wholly to the person who first receives the idea and reduces it to a practical form. It makes no difference that at the time he may be in the employ of another man who is paying him for devoting his time to the very subject in connection with which the invention is made." The lawyer suggested that the firm "enter into a contract with each of their employees to the effect that all inventions made in matters connected with the work which they are engaged to perform during their connection with the company shall belong to the company." "This," the lawyer advised, "while it would doubtless cause considerable trouble for the company, seems to be the best way in which the difficulty can be avoided. Whether it is practicable for you to make such contracts is of course a question for you to decide. We fear our suggestion is somewhat impracticable."
Building on the established patent law division of the act of inventing into distinct and separable parts, the “mental conception of the invention” and its reduction to practice, Prindle justified employer ownership of patents by imagining that the employer was generally responsible for the mental conception. To capture the attention of the “manufacturers” who were his intended audience, Prindle posited the scenario (highly stylized but drawn from a case) of a shoe manufacturer who “had trouble with his operatives” and wished to mechanize the part of his operation requiring skilled labor (the troublesome operatives) so that he could use “a class of labor that could easily be trained so that a strike of the trained operatives could be broken by training new hands.” In Prindle’s telling, the manufacturer “went to machinists and outlined a machine to accomplish his purpose. The manufacturer described the principal elements of the machine, and how they would work with relation to each other.” When “the machinists” filed a patent application for the resulting machine and litigation ensued, Prindle explained, the court held that the machinists failed to rebut the presumption that the employer was the inventor. Prindle’s narrative about invention was drawn from an antebellum workshop in which a master craftsman supervises a few apprentices and in which inventions can be traced to the idea of a single person. The story ignored the reality of invention in corporate R & D facilities but set up the metaphor that the corporation was the master craftsman and all the R & D employees were the “operatives” who simply reduced his ideas to practice. Elsewhere Prindle cautioned that special care was needed by one who “employs clever men and has them instructed in the details of his business” lest he “lay himself peculiarly open to the possibility that his employees may make inventions which would seriously hurt his business if he had to compete with them.”

Prindle concluded the chapter with the advice that firms “have a contract with every employee who is at all likely to make inventions which relate to the business of the employer” and asserted that the contracts would be enforceable even if supported by “no further provision for return for the inventions than the payment of the ordinary salary.” Prindle asserted the existence of “manufacturing concerns where every man in the drafting room and in the sales department, and every skilled employee, is under such a contract.” Clearly, DuPont had found in Prindle a lawyer who shared its perspective on the necessity of protecting the firm from the challenges of its inventive employees.

After Du Pont sued Masland, company officials began to examine more closely their practices with respect to employee ideas. They realized, to their chagrin, that the form contract Masland and other Experimental Station
employees had signed in 1905 covered only patents and inventions related to explosives, not their newer lines of business such as artificial leather. The contract also did not explicitly protect trade secrets. Du Pont's in-house counsel became anxious that the litigation might publicize these deficiencies in the contract, and might also alert employees to the fact that the company had insisted that its chemists assign patents that plainly were not covered by the contract. "This, of course, would be very suggestive to certain other employees in the laboratory," he worried, adding that widespread knowledge of it "is apt to be demoralizing" to "certain classes of employees of the company." While the Masland suit was pending between 1914 and 1917, the company tried to get all employees working in its labs to sign contracts not to disclose company secrets.

Du Pont officials remained anxious that Masland's firm was producing artificial leather. Prindle employed a private detective agency for all sorts of cloak-and-dagger snooping around the Masland factory to confirm his client's suspicions. One snuck through a fence, one obtained a meeting with Masland by posing as a businessman interested in purchasing artificial leather for export, one applied for a job at the Masland firm, and one even tried to pose as a Philadelphia Electric Company employee for purposes of gaining access to the Masland factory. When a detective finally reported in 1918 that the Masland factory was not manufacturing artificial leather, the company settled its accounts with its lawyers. All told, they paid Prindle's firm nearly $12,000 for their work on the case. Meanwhile, between 1911 and 1919, Du Pont's artificial leather business produced average profits of 15 percent, although the shoes made from Fabrikoid, which Du Pont had tested by forty mail carriers and a local shoe store in Wilmington, Delaware, were of only middling quality.

EASTMAN KODAK AND DU PONT exhibit the kind of multipronged strategy about innovation that mid-twentieth-century business students studied and business boosters cheered. In the labs, and in the offices of company managers, lawyers, and marketers, Eastman Kodak and Du Pont sought ways to innovate. They envisioned and sometimes created new and improved products; new and improved advertising campaigns based on new and improved trademarks; and new and improved legal relations with their new and improved employees, who enjoyed a new and improved middle-class life in the suburbs surrounding the companies' headquarters in Rochester and Wilmington.

A number of the firms that were the most zealous advocates of employer
intellectual property rights were also at the forefront of the development of consumer culture and the vigorous use of advertising brand-name products to generate customer demand for constantly new and improved products. The Eastman Kodak Company linked aggressive intellectual property protection, particularly with respect to employees, with aggressive marketing of its devices. Its cameras and film were protected through patent, trade secret, and trademark law, and its advertising campaigns were protected, as soon as the law said they could be protected, by copyright. Its vigilance in protecting intellectual property rights went hand in hand with its pioneering use of advertising to create a mass market for cameras and amateur photography. The exponential growth in amateur snapshot photography was driven by Eastman Kodak's continual creation of new, more reliable, easier to use, and more affordable cameras in the years between 1895 and 1930. The company's business strategy, which proved wildly successful for several decades, linked constant innovation with unceasing efforts to create demand for new products through advertising. Eventually the company concluded that it was easier to create a demand for the company's products by brand name than to prevent competitors from learning about Kodak technology by recruiting Kodak employees.

The expansion of the types of information subject to intellectual property rights that accompanied the development of consumer culture in the early twentieth century transformed the legal conception of employees' rights to capitalize on their skills and training in subsequent employment. If the popular attitudes about creativity and innovation were buffeted from many directions by the conflicting visions of the role of intellectual property in American life, the winds of change that firms described in courts blew all in one direction. The trend in the case law by the 1920s was toward ever broader and ever more robust intellectual property rights. Between 1895 and 1930 courts expanded the types of information that could be claimed as trade secrets and that could be patented or copyrighted, and employers claimed as proprietary increasingly broad categories of knowledge. Courts had understood throughout the nineteenth century that craft knowledge was economically valuable. They realized, for example, that the precise recipe for gunpowder was valuable and so were the techniques for mixing, handling, and storing it. They also recognized that firms would want the exact dimensions of a machine as well as rule-of-thumb knowledge about how to cast its metal components and keep it in working order. What changed so quickly after 1900 was not the judicial ability to imagine the economic value of all the knowledge and experience of a skilled workman or the value of a new design for a poster or handbill or the value of a new compilation of information, but
the judicial ability to imagine such knowledge as the exclusive property of a firm.

Once the judicial imagination caught fire about the benefits of corporate ownership of knowledge, the doctrinal consequences were significant. The focus of trade secret law shifted from tangible things (e.g., the drawings of a machine) to ideas (the design innovations contained in them); from the list of customers to the knowledge of their identities, locations, needs, and goodwill; and from the precise written formula for a substance to the general knowledge of the process and techniques for making it. Negative knowledge (i.e., what does not work to achieve a particular purpose) came to be recognized for the first time as a trade secret so that an employee could be restrained not only from using knowledge about what works to make a product, but also from using knowledge of what does not work.

Compilations of publicly available facts gained protection as trade secrets or through copyright. As the scope of copyright, trademark, and trade secrets expanded, the scope of an employee’s freely usable general knowledge, or even specialized skill and experience, diminished, and the public domain began to shrink.

As more and more types of information became intellectual property, in theory fewer and fewer forms of employee knowledge could plausibly be used in subsequent employment. Courts struggled to find an easily administrable “bright line” rule that would allow a desirable element of competition while allocating intellectual property rights to the corporation. One such “bright line” rule was the notion that employees leaving for subsequent employment could take information in their heads with them but nothing in writing, the so-called “memory rule.” Critics of the memory rule were fond of pointing out that tort liability ought not turn on whether former employees have bad memories or excellent recall. The persistence of the memory rule lay in the appeal of property concepts to define the scope of the employer’s rights. It also had the appeal of loosely corresponding to the judges’ intuitive sense of the difference between trade secrets and general knowledge. Yet even the memory rule lacked both specificity and the capacity to balance freedom to work with protection for corporate intellectual property when courts began to see that trade secrets could encompass ideas (the idea, for example, of using a particular chemical compound as an emulsion on photographic film) as well as things (a specific emulsion formula). The difficult task of assigning ownership of knowledge inevitably turned upon distinguishing protectable trade secrets from nonprotectable general knowledge, which always depended on understanding complicated technology through the testimony of self-interested witnesses. Beyond that, it has
been and remains a core normative judgment about the freedom and attributes of creative employees. Then, as now, courts tended to hide, perhaps from themselves, their normative judgments in their findings of fact. 106

The litigation brought by Eastman Kodak and Du Pont against Reichenbach, Masland, and others had significant consequences for the nature and culture of corporate R&D. Corporate control of intellectual property enabled collective invention of a spectacular array of electrical, chemical, and mechanical technologies that fueled the rapid growth of the American economy. It financed vast accumulations of wealth for some, and a degree of comfort and security for inventive employees of which their early nineteenth-century forebears could only have dreamed. It may or may not have produced a more equitable distribution of compensation among all of a company’s inventors than would have occurred in a legal regime that allocated intellectual property rights to the individual rather than to the firm. But it fundamentally changed the entrepreneurial prospects of inventive employees in many industries.

The scientists and engineers employed in corporate R&D were prevented by law from using the strategy for upward mobility that had been common in the nineteenth century. Unlike their predecessors, they could not easily take their economically valuable knowledge and go into business for themselves. The legal rules that restricted their mobility had the overtones of the old actions for enticement, treating their effort to depart their service for their corporate employers just as early nineteenth-century law treated a servant who was enticed from his master’s service. The diminished legal status of the inventive employee was obscured because the class divide between university-trained engineers and office clerks was thought far more germane than their dwindling prospects for entrepreneurship and independent control of the products of their labor. In other words, the significant erosion of the entrepreneurial prospects and social status of inventive employees was camouflaged by the education and other markers of upper-middle-class status of research employees in a large corporation.

While some inventors and authors remained entrepreneurial about controlling the intellectual property they produced by remaining outside the context of corporate employment, by the third decade of the twentieth century a large number of creators had accepted corporate jobs and forsaken the risks and rewards of controlling their own intellectual property. Within firms, what began to loom larger for many employees than intellectual property ownership was credit for the work they did and acknowledgment of the importance of their creative effort in creating the company’s products. Most chemists at Du Pont seemed to accept quite readily the legal obligation to

*Corporate Management of Science*
assign their patents to the firm. What they could not accept so easily was failing to be listed as an inventor, even if it had no legal consequence for ownership of a patent, and failing to be acknowledged within the firm as the originator of an idea, a patent, or a copyrighted work. Increasingly, employees sought recognition as much as financial reward from their employers. Attribution, and the respect accorded to inventors and authors, began to substitute for intellectual property (and the legal status of being the inventor or author) as the currency that would enable employees to advance their careers.
The Corporation’s Money Paid
for the Painting; Its Artist Colored It;
Its President Designed It

In inventors and authors have long been imagined to be individual humans because originality and creativity are imagined to be uniquely human attributes. As patent and copyright law came to recognize the validity of corporate intellectual property in the twentieth century, courts and legislators had to reconsider the relation between the creative employee and the corporate employer. In the burgeoning twentieth-century market for intellectual property as consumer goods, firms used the names of individual creators as markers of quality or authenticity to brand their products even as the commercialization of the production of art and books demanded corporate control of intellectual property. As businesses sought intellectual property protection for an increasingly broad and commercialized array of products, particularly in the area of copyright, the legal justifications proffered by their lawyers and accepted by judges for granting copyrights changed from protection of individual artistic expression to protection of corporate investment in producing innovative artifacts of popular culture. Firms insisted upon control of employee talent while demanding intellectual property protection for commercial products that were not “art” or “literature” as defined by the romantic celebrations of individual creativity. Their lawyers reconciled competing imperatives of corporate control and individual artistic expression by developing informal systems for attributing works to employees while insisting that legal rules of express or implied contract gave their clients ever greater control of both the process and products of employee creativity. Authorship
became a brand and a legal fiction, and the contract of employment emerged as a technology of authorship.

Courts and firms deployed romantic images of individual authorship to expand intellectual property rights in works that were created in a bureaucratic business environment anathema to the romanticized notion of authorship that had previously justified copyright monopolies. Courts first analogized the corporation to the studio or atelier of the great artist where the corporation's president did the creative work and the corporate employees, like a great painter's assistants, filled in the background and unimportant details. Walt Disney was to his animated films as Titian was to his paintings. Eventually it was no longer necessary to imagine the corporate president as the artist; as the legal fiction of corporate personhood gained traction in popular culture, law imagined the corporations as the artist. The Disney Corporation became the author.

While corporate personality was transforming the notion of collective authorship of commercial works, the implied contract of employment acquired new meaning that consolidated corporate control of employee creativity. Courts began to see commercial creation of books, lithographs, and other popular copyrighted works as a form of corporate R & D which firms should own by virtue of the corporate investment in the creative process. Courts used contract concepts to justify a shift from the old rule of presumptive employee ownership to a new rule of corporate ownership. Contract was fictionalized as an exercise of individual will and intention just as authorship ceased to be imagined as an exercise of individual will and intention.

Rand McNally, the map publisher, accommodated the realities of bureaucratic production of copyrights with the persistent need to attribute works to individual creators by devising internal corporate processes for attribution that substituted for copyright ownership. At Rand McNally, authorship became simultaneously a process of collective production and a brand advertising certain attributes of a commercial product. In the market for commercial art and texts, corporate "authors" deployed norms of attribution in the place of the law of copyright as the cultural capital of authorship. A nonlegal custom of attribution as a creator was all that was left to artists, authors, and inventors. A claim to attribution became the intellectual capital—but never the property—of the employee-creator. It also became the way in which corporate merchants of commercial products of "art" and "literature" built consumer loyalty to the corporate brand. Attribution of corporate products to individual employees guaranteed the artistic authenticity of the fabricated cultural commodities.
The Corporate Author and the Expansion of Intellectual Property

As intellectual property became more likely to be created in collaborative work settings, no single individual could plausibly claim to be the inventor or author, and no one person could have a compelling moral claim to control the idea or knowledge. As a consequence, when the employer was a corporation, its claim to be the “author” of the works created by its employees required that the corporation as a fictional person be analogized to the inventor or the author, and thus fit the individualist nineteenth-century paradigm of invention and originality. The turn-of-the-century conceptualization of the corporation as a rights-holding “person” played exactly this crucial rhetorical role. In a legal regime that preferred, both as a matter of rhetoric and as a matter of legal analysis, that some “person” be identified as the inventor of every patent or as the author of every copyright work, the creation of the corporate “person” occurred at exactly the right time. The legal fiction of the corporate person bridged the conceptual gap between collective and individual creation just when a bridge was needed.

Legal scholarship on the law of corporate personality in the 1890s and thereafter struggled to assimilate the behavior of groups into the legal concepts that had been built upon the behavior of individuals, like creativity, will, and intention. Ultimately, corporations were recognized as being “an aggregation of capital” rather than an “association of persons.” Once that occurred, it became possible for courts to conceive of innovation as being the product of wise management of corporate assets rather than the achievement of individual employees. But that process was not complete until the controversy over corporate personality abated in the third decade of the twentieth century.

As corporations grew in size and influence, they had to be assimilated as rights-holders within the traditional, individualist frameworks that dominated legal doctrines across the spectrum of American law. Reconciling individualism with the newly dominant business corporation presented a fundamental challenge to the legal theory of intellectual property. Before 1910, courts imagined workplace invention in largely individualist terms, assuming that the workplace was a congregation of individuals working in loose association and that rights to creative products could be attributed to individuals in the way that the law of partnership treated the rights and obligations of the firm as being rights and obligations of the individual partners. Even as corporations replaced partnerships as the dominant form of business organization, corporate law until the turn of the century tended to treat

The Corporation’s Money Paid for the Painting
corporations not very differently from partnerships. The re-imagining of a corporation as a single person made a big difference for copyright ownership. The ultimate legal fiction underlying modern copyright law is the fiction of corporate authorship. If the fiction were merely a shorthand way of saying that the corporation is the assignee of the works of an author, it would be one thing. But not every case that recognized employer ownership did so simply by assuming that the employee had expressly or implicitly agreed to assign a copyright. Some courts persisted in analyzing the matter as if the employer itself had to be the creator. In this context, the rise of the corporation played an ambiguous role. On the one hand, if judges saw authorship as a collaborative process, the fact that a business entity was a corporate body helped the employer’s case. The claim of a corporate “author,” composed of many different people working toward a common end, had greater rhetorical appeal than the claim of one individual partner to the work of another. On the other hand, the rise of corporate power threatened the very individualist premises and values of much nineteenth-century law. Inasmuch as courts regarded authorship as uniquely individual, corporate authorship was simultaneously oxymoronic and repugnant. Courts did not immediately capitulate to the empire-building tendencies of the growing corporations in this area any more than they did in any other area of law. One way to understand the schizophrenic state of the law of ownership of ideas is that judges were working out the tension between individualism and corporatism in American law and society.

The first case in which a court explicitly held that a corporation owned a copyright in an employee’s creation did not require significant departure from past rhetoric because the president of the corporation, “himself an artist of respectable attainments,” had been personally involved in the design of the advertising woodcut at issue. The employee, a printer named Stecher, allegedly painted the print under the supervision of the corporation’s president, one Schumacher. The corporation’s “money paid for the painting; its artist colored it; its president designed it, his was the ‘originating, inventive, and master mind.’” Analogizing the corporation to the artist’s studio, the court said: “The fact that the artist Stecher executed Schumacher’s design cannot defeat the copyright. The sculptor seldom touches the marble from which his statues are carved. The fact that the brush which embodied Schumacher’s idea was held by another artist rather than by himself cannot be important in considering a question of this character.” The personal involvement of the corporation’s president made the step to the fiction of corporate creation seem to be nothing more than an easy step of agency law attributing to the corporation the acts of its chief officer.

CORPORATE INTELLECTUAL PROPERTY
Eventually courts accepted corporate authorship even without evidence of corporate officers’ involvement in the acts of creation. In 1908, an author employed to write a book on the law of corporations challenged enforcement of a contract assigning the entire interest in the manuscript to the employer. The court endorsed the idea of corporations as authors when it rejected the employee-author’s contention that the defendant had breached the contract by causing the book to be copyrighted in the name of a corporation that was not a party to the contract.  

Similarly, corporate authorship was normalized into the copyright paradigm in a 1911 case concerning a catalog of designs for the newly popular phenomenon of ready-to-wear clothing. The basis for the corporation’s claim to authorship and therefore copyright was that the corporation’s managers “exercised the most careful supervision and discrimination and made large outlays and expenditures.” The court did not find the corporate manager’s artistic or literary creativity wholly irrelevant—there was “the most careful supervision and discrimination”—but the case made it possible to attribute the intellectual creativity of the employees to the corporate employer for purposes of determining the “author” of a copyrighted work. The corporation employed “artists and authors of peculiar skill and ability,” and the pictures and text “embodied the personal reaction of artists of recognized skill in their calling, and were pictures of artistic merit.” These qualities were necessary, in the court’s view, to justify a copyright at all.

To justify corporate ownership of the copyright (given that the court had just characterized the pictures as being “the personal reaction” of the employee-artists), the court then emphasized the “peculiar value” of the pictures “as portraying original conceptions and creations relating to wearing apparel, of great interest to a large proportion of the public on account of the originality and exercise of trained aesthetic faculties displayed in said illustrations.” Citing a mid-nineteenth-century case that had rejected the notion of employer authorship of employee works, along with two recent cases in which courts had accepted that employers might own the rights to texts prepared in collective workplace settings, the opinion fused earlier notions of employee authorship with the still-new idea of corporate authors of copyrighted advertisements and other purely commercial works.  

At the same time that courts were first contemplating corporate authorship, they also were grappling with growth in the types of materials subject to copyright. Courts alternately invoked and ignored eighteenth- and nineteenth-century notions of authorship to justify the existence of copyrights in new media such as advertising. By analogizing these commercial and corporate creations to the great artistic works of the past, judges and lawyers

*The Corporation’s Money Paid for the Painting*
legitimated new property rights in new media. Schumacher was “an artist of respectable attainments,” and his involvement as corporate president was akin to the master sculptor in his studio who “seldom touches the marble.”

In *Burrow-Giles Lithographic Company v. Sarony*, an 1884 U.S. Supreme Court case involving the copyright to a photograph of Oscar Wilde, the Court held that a portrait photographer used sufficient creativity in the composition and lighting of a publicity shot of Wilde to make a photograph a proper subject of copyright. The case is known primarily for its holding that photographs can be copyrighted. A significant but little-noticed feature of the opinion, however, is the Court’s approach to the hiring contract of the photographer. Parsing the contract in assessing the authorship of the photographs, the Court articulated a new view of the way that creativity could be hired. Although *Burrow-Giles Lithographic Co.* did not address an ownership dispute between employer and employee, its approach to the nature of creativity makes it an important point in the development of legal concepts of the creativity for hire.

That a dispute over the image of Oscar Wilde should have been part of the construction of the law of creativity for hire is revealing, and not entirely serendipitous, even though Wilde himself seems to have had no involvement in the litigation. Wilde (1854–1900) was a celebrated writer, lecturer, and aesthete who carefully protected his literary property rights but also freely allowed others to borrow his work and freely transgressed any number of social norms, including plagiarism. He was an early modern celebrity, the person who creates and markets his personality as a form of entertainment for others. He presented himself as a great talker and a larger-than-life personality; indeed, some of his contemporaries thought that Wilde’s “personality and conversation were far more wonderful than anything he wrote.” As Wilde himself said, “all Art [is] to a certain degree a mode of action, an attempt to realize one’s own personality on some imaginative plane out of reach of the trampling accidents and limitations of real life.”

Wilde’s self-constructed persona, which merged the late Romantic celebration of the artiste-aesthete with the burgeoning fin-de-siècle commercial and consumer culture, allowed him to explore “the corrosive impact of market exchange on cultural meaning.” One place the market most changed cultural meaning was in how corporations became purveyors of art, and celebrity became the way that commercialized art was valued. The commercialization of creativity facilitated the development of a market for celebrity in a consumer culture. At the time, mass-produced photographs of actors and other celebrities were popular consumer goods, as were mass-produced lithographs of paintings and other copies of works of fine art.
Wilde was an irresistible subject for an enterprising portraitist who fancied himself an artist and wanted to make a buck. An artistic photograph of Wilde the aesthete would appeal to the “art”-loving consumer public that imagined that possessing such an image would connect them to the world of aesthetics. It would also connect the entrepreneur-photographer to the world of art while making money too. What made the Wilde photograph worth litigating over was a commercial culture supporting the mass-marketing of images of literary celebrities. And what makes the case interesting is the way the Court portrayed the nature of creative authorship to accommodate the new reality that someone who saw a market for a new item of intellectual property would often hire someone else to generate a creative product.

Oscar Wilde arrived in New York in 1882 to do a series of poetry readings and lectures on aesthetics. Wilde’s tour was promoted by his manager, Richard D’Oyley Carte, to publicize Gilbert and Sullivan’s new production, Patience. Carte, who also had a business relationship with Gilbert and Sullivan, realized that Patience, which satirized English aestheticism, was so contemporary that American audiences would not get it. As Wilde was a leading figure in aestheticism, it made perfect sense to have him lecture in a city just before or during the opera’s run in order to alert audiences to the subject of the work, although the connection between the two was never specifically advertised. With a little help, audiences might recognize Wilde in a character in the opera:

A most intense young man,  
A soulful-eyed young man,  
An ultra-poetical, super aesthetical,  
Out-of-the-way young man!  

As part of the publicity for the tour, Carte arranged for Wilde to be photographed dressed in a velvet jacket and vest, silk knee-breeches, and slippers adorned with bows—“the costume, in short, that made him the hit of the New York social whirl that season.” The photographer was Napoleon Sarony, a leading portrait photographer of entertainers in that era. Multiple images were taken in various poses. Sarony himself neither took the photographs nor printed them. His studio employees put the plates into the camera, removed and replaced the lens cap, handled the props and costumes, and printed the photographs. It was, indeed, Sarony’s own lack of technical involvement that the Court latched onto in its opinion as defining his artistic contribution to the photograph. As the Supreme Court said, quoting the trial court’s findings, which in turn quoted Sarony’s complaint, the photograph

*The Corporation’s Money Paid for the Painting*
represented Sarony's "own original mental conception, to which he gave visible form by posing the said Oscar Wilde in front of the camera, selecting and arranging the costume, draperies, and other various accessories in said photograph, arranging the subject so as to present graceful outlines, arranging and disposing the light and shade, suggesting and evoking the desired expression."

The case was litigated without a jury on a thin record consisting mainly of an agreed statement of facts and copies of the photographs in dispute. The trial court's findings about the nature of the Wilde photograph and Sarony's involvement in making it are drawn verbatim from the allegations in Sarony's complaint. Sarony's lawyer chose that characterization of his involvement in making photographs in order to refute a view of photographs, common at that time, as being unmediated representations of nature produced by light and machine rather than constructed images created by human creativity. But the description of Sarony's work also suited Sarony's own self-conception and marketing strategy; Sarony played up his ability to compose a scene and to make the sitter look a certain way and played down any involvement in the nitty-gritty of producing photographs: "About the chemistry of photography, he told an interviewer, he knew nothing and cared less. He limited his role in the operation to setting up the camera and posing the sitter. He did not even take the pictures himself. 'If I make a position and his camera is right,' Sarony once said, 'my long-time assistant Benjamin Richardson, is able to catch my ideas as deftly and quickly as necessary.'"

Sarony's job was to hustle up business, which he did by relentless socializing and self-promotion, and to coax, cajole, flatter, and bully the subject into posing as Sarony thought best. What the Court had to decide, in a litigation that arose because the Wilde tour created such a sensation that a lithography studio copied the photo, was whether Sarony's contribution to the photograph involved enough creativity to render the photograph a proper subject of copyright.

In teasing out whether the fact that the photographer created for hire somehow vitiated the degree of creativity necessary to sustain a copyright, Justice Miller's opinion for the Court sought guidance from an English case involving a photograph of an Australian cricket team. The dispute in the English case was whether a London firm, which had arranged for the photo to be taken and "sent one of the artists in their employ from London to some country town to do it," was the author of the photo because it "owned the establishment in London, where the photographs were made from the negative, and were sold, and . . . had the negative taken by one of their men." The English court held that the author was the man who "superintended the
arrangement, who ... actually formed the picture by putting the persons in position and arranging the place where the people are to be.” Justice Miller noted approvingly that the English court held that the photographer, not his employer, was entitled to the copyright, and then translated the relevance of that fact into the Wilde photo case by discerning a principle that “the author is the man who really represents, creates, or gives effect to the idea, fancy, or imagination.” The English firm that had hired the photographer had not been present when the photo was composed and taken, and thus it could not be the author. Sarony, by contrast, was described as the person who created the image of Wilde by composing the scene.

Of course, Burrow-Giles was a dispute over the scope of copyright (is a photograph copyrightable?) and not over ownership of the photo. As between the lithography firm that indisputably copied the Wilde photograph and Sarony, it is clear that Sarony deserved to win. The case did not address the degree of creativity that Sarony, as opposed to his assistants, would have to exercise in order to justify him in claiming the photograph as his work. What is significant in the discussion of hiring is that the Court found nothing inconsistent between hiring creativity, on the one hand, and the nature of authorship and original intellectual creation, on the other. Creativity could be hired, and the products of creativity could be sold in an employment contract. The photo was therefore an appropriate subject for copyright, notwithstanding its commercial for-hire character.

Burrow-Giles sits firmly in the nineteenth century in its presumption that the employee is the author of a work made for hire when it is the employee's creativity that is reflected in the work. Until the first decade of the twentieth century, employee authorship, and therefore employee copyright ownership, would remain the presumptive rule. What had begun changing in the 1870s and 1880s, however, was that courts chose to analyze ownership and control of workplace knowledge in contractual terms rather than according to the older notion that the products of any person's creativity were necessarily the creator's property. Initially, courts interpreted these putative contracts favorably to employees. Nevertheless, the establishment of contract as the dominant framework was the foundation upon which radical change occurred at the end of the century. The newly dominant notion that all work relationships are entirely contractual was the legal conduit for a rapid shift at the turn of the twentieth century from employee ownership to employer ownership of innovation. By the early twentieth century, courts presumed that firms owned the products of employee creativity and abandoned the approach to contract interpretation that had given employees control over their creativity and its products.

*The Corporation's Money Paid for the Painting*
Contractual Allocation of Authorship and Attribution

The concept of corporate personality transformed how courts understood the relationship of employment by enabling judges and lawyers to see these cases not as a dispute between two individuals, in which the employer as a person was claiming an idea that was not his, but rather as a dispute between a corporate entity, of which the employee had been a part, and an employee who was trying to appropriate for himself one of the corporation’s valuable assets. Courts began to see the importance to firms of freely using the knowledge of their employees. The production of commercial texts was seen as a form of corporate research and development. For example, a court found valid the copyright to an encyclopedia of law without the traditional need to identify the actual authors. To identify a human author was “unnecessary, as it might be impracticable,” because the “publication is the result of the intellectual labor of the editors and compilers employed by the complainant.”

At the same time, courts became more inclined to characterize the rules regarding copyright ownership in contract terms rather than in the terms of immutable rules and moral right that had predominated in earlier cases. The judicial endorsement of a contractarian view of copyright ownership paved the way for corporations to gain control of copyrights by contracting around employee rights that previously had been all but irrevocable.

Contract concepts were useful in reconciling corporate copyright ownership with earlier nineteenth-century commitments to free labor and entrepreneurship. And firms managed to substitute non-legally binding norms of internal attribution of creativity to individuals for the old practice of employee copyright ownership. The result was that firms owned the copyrights to employee works, and employees received only that degree of authorship credit that firms deemed necessary to maintain employee loyalty and to facilitate consumer identification of particular products with the newly valuable corporate brands.

At the turn of the twentieth century, courts began to find that employing a worker or commissioning a work sufficed to entitle the employer to the copyright. The courts in these cases typically did not acknowledge the difference between the precedents, all of which involved an express contractual allocation of copyright, and the instant situations in which no such contract existed. In the widely cited case of Collier Engineer Co. v. United Correspondence School Co. (1899), a salaried employee had the job of preparing and revising instructional materials for a correspondence school. In subsequent employment, the employee-author sought to write similar materials, and the former employer sued to prevent the employee from taking the job.
court denied the request for a preliminary injunction against competitive employment, finding it unclear from the evidence whether the proposed new materials would infringe the copyright because both the allegedly infringing materials and the materials prepared for the first employer were compilations drawn from other sources. The court nevertheless stated without elaboration that the former employer was entitled to the copyright on the original materials, which of course raised the possibility of future copyright infringement litigation against the employee. The court acknowledged the possibility that the employee would be unduly constrained from using the knowledge he had acquired about teaching and so attempted to find a middle ground:

[A]lthough Ewald was not at liberty to reproduce so much of his work as had been copyrighted by the employers for whom it was prepared, even by availing of his recollection of the contents of the copyrighted pamphlets, he was not debarred, after his contract terminated, from making a new compilation, nor from using the same original sources of information, nor from availing of such information as to the needs of students and the best methods of getting in mental touch with them as he may have acquired while superintending complainant's school. 29

A similar phenomenon could be seen in a case in which the author was not hired to produce works on an ongoing basis but was instead hired to produce just one thing. In Press Publishing Co. v. Monroe (1896), which involved a poem commissioned by the World's Fair organizing committee, the court found that an ambiguous contract that allocated the copyright to the poet granted the committee a license to publish and reproduce it. 30 The irony of the case was that the World's Fair organizing committee—which was nominally dedicated to sharing knowledge and innovation throughout the world—was the driving force behind greater control of intellectual property.

The popularity with lawyers and judges of contract as the totalizing view of commercial relations was the motive force behind the transformation of employee ownership of copyrights. In the influential 1888 opinion in Callaghan v. Myers, an action alleging infringement of the reported decisions of the Illinois Supreme Court, the U.S. Supreme Court insisted for the first time that employer-employee disputes over copyright ownership should be resolved by reference to the “agreement” between the parties, even though in Callaghan there was no express contract. 31 The power of the Court's rhetoric was its emphasis on freedom of contract. The power of the Court's result was to enable courts to drastically revise the law while appearing to do nothing

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except honor the will of the parties, even though the parties had not clearly expressed their views about copyright ownership. In the case, Myers, a seller of law books in Chicago, had purchased the copyrights to several years' worth of reported decisions of the Illinois Supreme Court from Norman Freeman, the reporter of decisions. Myers had arranged to have the decisions printed and bound, along with supplemental material written by Freeman (such as short descriptions of each case, headnotes with the principal points of law established in the opinion, statements of the facts of the case where they were not stated in the court's opinion, statements of the issues presented, and a table of cases in each volume). Myers then planned to sell the books in his shop in Chicago or through traveling salesmen who visited lawyers throughout the state.

The Callaghan firm, a competing seller of law books, sought to sell its own complete series of decisions of the Illinois courts and had already purchased the copyrights to the first thirty volumes of the state supreme court's decisions. Callaghan wanted to purchase the copyrights to Myers's volumes. They could not agree on a price. Callaghan tried and failed to get Freeman to grant the right to publish the reports and also was involved in the introduction of a bill to the Illinois legislature that would make the Callaghan firm the official publishers of the reports. None of these strategies worked. Freeman was involved in selling some of his books for himself; he and Myers considered it in their mutual interest to keep Callaghan from getting the rights to a complete set, and so wanted to be sure that Myers maintained control of volumes 32 to 46. As Freeman wrote to Myers, "[L]et us pull together in this matter and beat the d——d Irishman. He has told enough lies about you and me to pave hell over ten feet deep." Believing that only a complete set of all the decisions, beginning with volume 1, would sell, particularly as many Chicago lawyers had lost their libraries in the great fire of 1871, Callaghan eventually went ahead and copied the decisions published in Myers's published volumes and proceeded to sell its own complete series of the court's decisions. Myers sued.

The defendants argued that because Freeman, the reporter, could acquire no valid copyright in decisions (because the judges were the authors) or in the supplemental materials (because Freeman wrote them while in the employ of the Illinois Supreme Court), Myers had no valid copyright. The lower court found the contention would have "great force" "if an adequate compensation was paid by the state to the reporter for the work done by him in preparing volumes of reports." But the court believed that the reporter's compensation was so low that it must have been the state's intention that the profits from the sales of the reports "constituted part of the perquisites
of his office.”33 On appeal, the Supreme Court reached the same result for different reasons. Whereas the lower court had relied on an express agreement between the parties, the Supreme Court relied on an implied agreement: “Even though a reporter may be a sworn public officer, appointed by the authority of the government which creates the court of which he is made the reporter, and even though he may be paid a fixed salary for his labors, yet, in the absence of any inhibition forbidding him to take a copyright for that which is the lawful subject of copyright in him, or reserving a copyright to the government as the assignee of his work, he is not deprived of the privilege of taking out a copyright, which would otherwise exist.” Later, the Court added that whether the reporter was compensated by salary (he was not), or even by the state’s purchase of a certain number of volumes, was irrelevant: “[I]n the view we take of the case, the question of a salary or no salary has no bearing upon the subject.” Rather, the Court said, there was “a tacit assent by the government to his exercising such privilege.”34

The concept of “tacit assent” or “implied contract” opened the door to a later reallocation of patent and copyright ownership simply by judicial reinterpretation of the implied contract between employer and employee to include a principle of employer ownership. In other words, once the courts began to think of copyright ownership as a matter of “tacit assent”—rather than as a virtually inalienable right associated with ownership of real property or in terms of the strong tie connoted by the ideology of the hero-inventor or the romantic author—courts felt a different default rule was appropriate.35

Early cases following Callaghan concluded that employees owned copyrights because their compensation was too paltry to justify a sale of the copyright to a valuable work. As the New York high court explained in awarding the copyright to a star catalog to the director of a college observatory instead of the college: “Since the college was financially unable to pay him anything approaching a reasonable salary, it may easily be inferred that the director would be allowed and expected to do for himself much work of his own for which he would not be accountable to the college, and which he could use or dispose of as he pleased.”36 As in Callaghan, the trial court had found that there was no agreement between the observatory and the director as to who should own the copyright to the catalog. Also as in Callaghan, the trial court thought: that in the absence of any explicit agreement, “it can hardly be claimed the observatory or college would become the owners of the work [the employees] might, as authors, produce and publish to the world.” The institution could look only to the more intangible benefits that flow from having in their employ “men who might become eminent and distinguished by reason of the mental labor and results they achieved.”37

The Corporation’s Money Paid for the Painting
In both Callaghan and the college observatory case, the employee-authors enjoyed a substantial degree of independence in the manner, means, and timing of their work, which combined with the measly salary suggests that these men were what today would be deemed independent contractors rather than employees. But the distinction between employees and independent contractors did not exist as clearly in American law then as it does today, and, in any event, the courts never mentioned whether the author was a “servant” or a “contractor.” Nor did courts observe the distinction when they applied the rule to cases involving workers who today would be deemed employees. It may very well have been the independence of the creative employee that influenced the court to adopt a default rule of employee ownership, and thus the intuition of early courts was similar to the intuition underlying the modern law that independent contractors should presumptively own the copyrights to their works. But none of that was made explicit in the cases. Rather, the courts contended simply that one must examine the “contract express or implied” between the parties, without articulating the basis for interpreting implied understandings.38

The notion that employer ownership of copyrights was implicit in the contract of hiring a creative worker was finally established firmly by statute, not by judicial decision. In 1909, when Congress thoroughly revised the copyright law, advocates of a strong rule of employer ownership of copyrights to employee-generated works gained a significant victory in persuading Congress to add to the statute, for the first time, a provision addressing ownership of copyrighted works created in an employment context.39 The legislative history of the revision process is the one place where we have an archival record of the debates among advocates for employers and for writers over the policy of corporate control of employee-generated copyrights. The debate occurred in the context of a pair of conferences convened by the Librarian of Congress in 1905 and 1906. The Library of Congress played a significant institutional role in copyright law as the repository of all registered copyrighted works, so it was the logical entity for the task of overhauling copyright law as delegated by Congress. Herbert Putnam, the Librarian of Congress, invited representatives from a number of industries and from the American Authors’ League, which represented writers, to discuss the need for and the desirable terms of a revised copyright law.

The draft bill presented at the first conference stated that only “authors” could obtain copyrights.40 In a series of discussions on that provision, representatives of various publishing and lithographic firms advocated recognition of the right of employers to obtain copyrights. Samuel J. Elder of Boston urged that publishers of encyclopedias and other works requiring the assis-
tance of a large number of people needed some method other than individual assignments to obtain effective ownership of the copyright to the complete project. The problem, he explained, was that only the "author" of a work, and not the "proprietor" who owned the copyright based on assignment from the author, could obtain the renewal of the copyright. To renew the copyright to an encyclopedia, the publisher would "have to go searching all over the world for widows and legitimate children, and the search is so great that the renewal term can hardly be obtained." Elder noted, however, that any revision to enable publishers to obtain renewals would have to define the employer as an "author" because Congress's power to grant copyrights is "confined by the language of the Constitution to authors." The simple expedient, therefore, was simply to adopt the expansive definition of "author" to include "the assignees of authors." 641

Robert Underwood Johnson, secretary of the American Authors' Copyright League, objected to the notion that an employer should be deemed the "author" of works created by employees. He proposed that the statute create two categories of copyright owners: "authors" and "proprietors." He insisted that "a man who gets up a cyclopedia and contracts with other people to write for him" was only "the proprietor and ought to be considered the proprietor, and not the author." 642 The notion of "author" was to be reserved only for the actual creator, and was not to be treated as simply a term of art.

The Copyright Office of the Library of Congress drafted a revised bill that did not have a general work-for-hire provision, but which did list in separate sections the various persons who would be entitled to claim a copyright. Among them was the "publisher of a composite or collective work (a 'series,' a 'library,' or an encyclopedia) which has been produced at his instance and expense." In a separate section, the draft bill stated that the person who commissions a portrait would be entitled to the copyright "as if he were the author, in the absence of any agreement in writing to the contrary." 643

Discussion on the revised draft revealed that representatives of publishers and employers remained dissatisfied. One complained: "We have people who work for us who make engravings or etchings for us under salary. Under the new law—if it becomes a law as drafted—they would have the right to copyright, and I think it would be well to express in such a law that where no agreement exists to the contrary the payment of a salary to an employee shall entitle an employer to all rights to obtain a copyright in any work performed during the hours for which such salary is paid. It seems to me these things should not be left to the courts to decide." 644

The principle of employer ownership in the case of truly jointly authored works was uncontroversial, even to the representatives of authors. For ex-

The Corporation's Money Paid for the Painting
ample, the American Authors’ Copyright League proposed alternative language for the definition of author to include not only writers, composers, and painters, but also “the conductors of a periodical, the joint authors of a collaborative work, a corporate body with respect to the publications of such corporation, and a person or persons at whose instance and expense a composite work is produced.” Some insisted that any such rule should give employers only so much of a right in the works as the employer’s investment in salary or materials justified. The representative of the Lithographers’ Association and the Reproductive Arts Copyright League argued that “the case of manufactures” should be distinguished from the case of other artists and writers: “Now it seems to me that . . . the right belonging to that artist who is employed for the purpose of making a work of art so many hours a day, or that literary producer who is employed for so many hours, should be very different from the right that is held by the independent artist or man who makes a painting for art’s sake.”

After the second conference, the Librarian of Congress and the Copyright Office circulated a new draft bill. This version contained a new provision that an author entitled to a copyright could include “[a]n employer, in the case of a work produced by an employee during the hours for which salary is paid, subject to any agreement to the contrary.” The final version of the work-for-hire provision, which appeared in 1906 in bills introduced at joint hearings held before the House and Senate committees, stated that “the word ‘author’ shall include an employer in the case of works made for hire”—the language that has been in the statute ever since.

The 1909 Copyright Act enshrined in statute a particular vision of the nature and role of implied and express agreements regarding the circumstances in which an employer would own the rights to employee creativity. The statute made it unnecessary for employers to contract with employee authors to acquire the copyrights to their work by adopting a presumption that employee works are always made for hire. Corporations became not merely the owners of the copyright but their legally defined authors. Authorship became a legal fiction just as corporations became, at least in the public mind, ever more real.

**Mapping a New Approach to Innovation**

The story of corporate authorship told in the 1909 copyright revision hearings by advocates for publishers was reflected in the evolution of the Rand McNally firm, publishers of maps and globes. It was a move from employee ownership of copyrights to an organized corporate strategy to control copy-
rights through the development of bureaucratic employment practices and insistence on the contractual designations of the firm as the author of all employee works. What also appears in the Rand McNally story, however, is the development of the modern norm of crediting employee-authors within the firm's internal culture while insisting on corporate authorship as a form of brand identity to the external world. When employees were credited as authors to the external world it was to leaven the dry and anonymous corporate brand with the authenticity of a reference to an actual human creator.

In 1856, William H. Rand established a printing office above a bookstore on Lake Street in Chicago. It was a job shop, printing mainly tickets and railroad timetables. In 1858 Rand hired Andrew McNally and in 1864 they formed a partnership. Rand McNally & Company moved aggressively in the map publishing business, aiming to reduce costs and increase the quality and the number of publications. To that end, the company acquired patents from anyone—including both employees and outsiders to the firm—who seemed to have a better method of designing, engraving, or printing maps. Company employees from the beginning routinely assigned their patents to the firm, as Andrew McNally did in 1871 on a patent for an improvement in map mounting.49

Rand McNally’s aggressive protection of intellectual property may be attributable to the fact that the company early on understood itself to be a firm that produced and sold knowledge. Unlike other businesses of the 1880s and 1890s (such as railroads) that allowed employees greater control over the intellectual property they generated because the intellectual property rights were a means to an end (e.g., more efficient transportation), at Rand McNally intellectual property rights were the company’s business. The firm could also build on the long tradition in publishing of obtaining copyright assignments from all authors. But Rand McNally, unlike traditional publishers, employed a large number of authors as employees on a long-term basis. Many firms that produced technology thought about contracting with outsiders to acquire intellectual property rights (usually patents), but lacked an industry tradition of contracting with employees because, for the most part, employees were not seen primarily as generators of intellectual property. Rand McNally, however, regarded itself as a company in a constant process of gathering information to improve its existing products and encouraging its employees to develop new products. Organized and even bureaucratized research and innovation were part of the firm culture, and Rand McNally’s claim to own all employee copyrights and patents rested on that. To do this, the company sought out associations with talented geographers, cartographers,
and draftspersons. When the reputation of the employee would enhance the firm’s reputation as a producer of quality products, it marketed its products with its employees’ names attached.

Circumstances seemed to dictate the Rand McNally policy toward intellectual property rights as much as company policy. The company routinely incorporated material from government sources into its maps. Beginning in the 1870s, it contracted with various people to produce material to be published by the firm, and the ownership of copyright and credit for the creation seemed to have been negotiated on a case-by-case basis. In some cases, the copyright page or copyright registrations indicate that Rand McNally was only the publisher and the author was the copyright owner; in others Rand McNally claimed the copyright as the author but gave credit to an author or editor.\(^5\) And in some, such as Rand McNally’s Banker’s Monthly, which it began publishing in 1884, no credit was given to any employee except occasionally a byline in an article published in it.\(^5\)

Some early Rand McNally works credited individual authors. A guidebook published by William Rand in 1859, The Complete Guide to the Gold Districts of Kansas and Nebraska, credited Pease and Cole as authors. In 1869 and 1871, Rand McNally & Company published their first Western Railway Guide—The Traveler’s Handbook to All Western Railway and Steamboat Lines, which said it was arranged and compiled by Robert A. Bower, who was the editor of the Railway Guide. The guide carried a “General Railway Map” that credited Gaylord Watson of New York as engraver.\(^5\) Typically, however, Rand McNally did not publicly identify the compilers, cartographers, or draftsmen who helped create its maps, but only at most the supervising engraver. An 1876 map, for example, stated that it was “engraved under the direction of C. H. Waite.” Immediately below that line, however, the map’s title cartouche read, “Drawn, Engraved and Printed in Colors (under Letters Patent) by Rand McNally & Co., Chicago.”\(^5\)

In the early days, the company was willing to produce maps for others without claiming copyright or credit. In 1877, for example, the Chicago & Northwestern Railroad published a timetable with a Rand McNally map of part of the United States showing the railroad. The only attribution on the map was a covert one that would be intelligible only to insiders and that was for the purpose of deterring unauthorized copying rather than publicizing the company or honoring the employees who made it: the map deliberately and erroneously labeled an Oregon mountain “Mt. R. A. Bower” (Bower was the editor of Rand McNally’s railway guide). Yet even this form of clandestine author credit leaves doubt about whether Bower was an author of the map or simply the head of the office that produced it.

**CORPORATE INTELLECTUAL PROPERTY**
At the beginning, employees with special talents or who brought valuable compilations of information to the company were permitted to operate almost as inside contractors who could profit from the sale of directories or other books produced by employees they supervised. Thus, even though the company claimed ownership of all copyrights, it made arrangements with some employees to share the profits from them. In 1876, for example, the company began publishing a bankers' directory which in the early years was described as being “compiled by” Charles R. Williams. The original agreement between Williams and Rand McNally was a matter of dispute: Williams claimed he compiled the directory in 1875 and arranged with Rand McNally to publish it in 1876 and that the two agreed to split the profits. Rand McNally claimed Williams was an employee and that the firm owned the rights to the directory. In 1880, Williams and Rand McNally entered into an agreement by which Williams was to receive one-third of the profits. The parties also agreed that Williams would run the publishing of the directory, including paying the bills, and that Rand McNally would charge the bills against the profits of the directory. By 1892, the directory was producing $100,000 in profit annually. Williams grew dissatisfied and threatened to leave Rand McNally. Rand McNally filed criminal charges against him, asserting that he had forged the endorsement on a number of company checks in connection with the operation of the directory business. When confronted by the company's attorney, he signed a document stating that he owed the company $16,000 and agreed to cancel his employment agreement with the firm. Williams later testified that he had signed the document under duress. After a bitterly fought criminal trial, Williams was acquitted, evidently based on testimony that he had believed he was authorized to endorse the checks. Williams moved to New York and announced his intention to publish a bankers' directory there.54 In later years, as we will see, although the company continued to have some high-level employees who were responsible for certain projects and supervised Rand McNally employees to produce them, there were no similar profit-sharing arrangements. Individual entrepreneurs no longer existed within the firm, and instead they profited only from working for a respected company.

Opportunities for entrepreneurship for employees were limited to the possibility of leaving the firm to start a new company. And, while the firm aggressively claimed all intellectual property rights to employee work, it was largely powerless to restrict former employees from starting competing firms. Company officials sometimes tried to stop such defections but had little success. In 1900, a Rand McNally employee named Caleb S. Hammond left the firm to found the New York map publishing firm that still bears his

The Corporation's Money Paid for the Painting
name and was run by Hammond family members for much of the twentieth century. Louis Andrews, another Rand McNally employee, left to found another competitor, the American Map Company. The most acrimonious dispute with a former employee who left to found a competing firm was that with Harry M. Gousha, who left Rand McNally's successful road map division in 1926 to start a competing road map business, the H. M. Gousha Company, which became a significant competitor to Rand McNally. Rand McNally filed a civil suit against Gousha in Illinois state court, but no records of the suit survive.

As Rand McNally's list of maps, atlases, guides, globes, educational texts, and trade books grew, it became increasingly organized about developing strong intellectual property rights. By the mid-1890s, the company had an established process for applying for patents and copyrights to globes, maps, map display cases, atlases, and other materials produced by the staff of full-time employees and contract workers who participated in all phases of the production process. Both current employees and outside authors assigned the copyright or patent to the firm.

Rand McNally's production of maps, globes, atlases, and other guides resembled the evolution of corporate research laboratories occurring in other industries in that era. First, the company made organized efforts to develop new material and to improve on existing company products through collaborative innovation. From its earliest maps through the twentieth century, the company's managers and employees designed and maintained an active research program aimed at gathering geographic and other information from every possible source. They devised a system of using postcards mailed to businesses and government officials all over the country to gather information that was then incorporated into the various road maps, atlases, indexes, and business directories that the company published. Second, the company also sought out associations with talented geographers, cartographers, draftspersons, and artists whose knowledge and reputation would enhance the firm's store of knowledge and its reputation both with other firms and with customers. Third, the company insisted upon ownership of all intellectual property rights to company products. Fourth, the company created an internal economy of credit and reputation that in some ways substituted for the old system whereby employees owned the intellectual property. Rand McNally, for example, often credited the employees as the authors (both in communications within the firm and in the products sold outside the firm). It was the informal, noncontractual, and extralegal process of author attribution that was the crucial mechanism by which the company reconciled its creative and high-status employees to the new regime of bureaucratic work.
and the loss of entrepreneurial opportunity and economic dependence that came with total employer control of intellectual property rights. Attribution and honoring employee creativity is an important psychic reward to most people, and firms like Rand McNally realized that credit could substitute for intellectual property ownership as a reward to encourage employee innovation.

This corporate practice of attracting top talent to enhance the firm’s reputation and then informally and implicitly exchanging author attribution for corporate copyright ownership may be seen in Rand McNally’s longtime affiliation with University of Chicago professor of geography J. Paul Goode. Goode first began working with Rand McNally in 1900 while he was finishing a Ph.D., three years before he joined the faculty at the University of Chicago. In the following years, Rand McNally published a number of works designated as “his,” including Goode’s School Atlas, Goode’s Wall Maps, and eventually Goode’s Political Globe. While Goode, like other authors, assigned his copyrights in these works and their multiple revised editions to Rand McNally, the company relentlessly promoted the products as being his work: “Originally conceived by Dr. J. Paul Goode, eminent cartographer, professor of geography at the University of Chicago, and editor of the Goode Series of Wall Maps and Goode School Atlas, every line and letter was placed on the globe under his personal supervision; each color was applied under his direction.” The company produced a catalog featuring his photograph devoted exclusively to “his” works. Although the original contracts between Goode and the company are lost, the extracts of them in the company files note only his agreements with the firm about copyright assignments and his share of the profits; there is nothing about whether credit to him for his work was a term of their agreement.

The precise allocation of intellectual property rights between Goode, the University of Chicago, and Rand McNally remain unclear. While Rand McNally owned the copyright to the books and maps they published under his name, the University of Chicago owned the copyright to one of his most famous innovations in cartography, the homolosine equal-area projection, a method of portraying the entire globe on a flat map with minimal distortion in the size of the continents. The 1932 edition of his School Atlas lists Rand McNally as the copyright owner of the book, and also separately of every map included in it. Yet, in the preface, Goode thanked the University of Chicago as owner of the copyright “for permission to use Goode’s homolosine equal-area projection for the world maps in this edition.” Even in the acknowledgment of copyright ownership, Goode still insisted on attaching his name to the homolosine equal-area projection. Both Goode and Rand

The Corporation’s Money Paid for the Painting
McNally believed it was in their interest for Goode's name to be attached to his work wherever possible, regardless of copyright ownership. Goode was an eminent cartographer and published influential academic papers on map projections. On account of his university affiliation and academic reputation, Rand McNally's use of his name was a sort of trademark attesting to the quality and reliability of Rand McNally maps. 61

Rand McNally's approach to granting credit for creation, even as it owned all intellectual property rights, may have stemmed in part from the number of important innovators who were not technically company employees. In addition to Goode, another map innovator at the firm, John G. Brink, worked for the company on a contract basis for many years, at one point in 1923 running a twenty-employee drafting room on the tenth floor of the company's Chicago headquarters. Brink was widely credited in company literature and trade publications as being the "Father of Road Maps" and the person who first conceived the company's ambitious efforts to dominate the road map business. He had his own art studio in Waukegan in 1916 when he was suggested to Rand McNally as someone who could draft county maps on the side. The county map business was declining, and the company announced a competition to its employees for ideas for new products. The employee who submitted the winning idea would receive a $100 prize. Brink won with a suggestion that the company produce maps on which each road was identified by a distinguishing symbol to make them easier to read.

At the time, roads were not numbered and most did not have consistently used names, which made drawing legible road maps quite challenging. The company adopted Brink's idea, and his Illinois "Auto Trails" map, published by Rand McNally in 1917, became the first road map to show numbered highways. The company quickly realized that for the system to be really helpful, roads would need signs with numbers that corresponded to the route numbers on the map. So the company began an ambitious effort, which Brink oversaw for several years, of working with cities, counties, local automobile associations, and local utilities to number roads and then to install numbers on the telephone and power poles along the road side. The road sign and road map project, and the vigorous marketing of road maps to businesses that would sell them to consumers, became a huge business for Rand McNally in the 1920s until the oil companies began to distribute free road maps to promote their new gasoline filling stations and to build customer loyalty to their brand. In 1925, when creation of a national highway system was first discussed in a committee under the secretary of agriculture, John Brink and other Rand McNally employees collaborated with government officials on the numbering system. As Brink said in his diary, "I have marked up several
sets of maps and submitted them to Mr. James [of the U.S. Bureau of Public Roads] for a numbering scheme. It would be of great benefit to us, for it will lessen the ever-confusing problems of showing trails on our maps."62

As Rand McNally's road map business was growing, Brink was persuaded to move his operations from his own office in Waukegan to the company headquarters in Chicago. Upon taking over the Auto Trails road map project, he became involved not only in drafting maps but in the physical numbering of highways upon which the map symbols were based. He personally supervised the installation of road signs all over the United States; one 1921 contract between Rand McNally and the manager of the engineering division of the Jacksonville, Florida, auto club stipulated that the quality of the road signs that would be installed pursuant to the contract would be the same as the work completed "and inspected in the presence of Mr. John G. Brink on September 12, 1921."63

Notwithstanding his full-time work for Rand McNally and his responsibility for the Auto Trails project, Brink remained technically an independent contractor. The road map project did not formally become part of Rand McNally until 1926, and until it did Brink operated it as a firm within the firm. When the young Helmuth Bay, who later became one of the lead cartographers for Rand McNally, first applied to the company for a job in 1923, he was told to go see John Brink. "Brink told me he made road maps for Rand McNally on a contract basis, that he had a full crew, and therefore suggested that I go down and try the Map Drafting Department which was operated by the Company. So I went down to the main offices on the second floor and was shown to the office of James McNally, better known as 'Uncle Jim.'64 (Uncle Jim, after chatting with him long enough to decide he had potential, sent Bay to apply for a job with the head of the map drafting department, who agreed to hire him only if he could prove by drawing a "practice map" that he had the necessary skills.)65 Although Brink worked as an independent contractor, his maps were copyrighted by Rand McNally. Indeed, his 1917 road map of Illinois, the first road map showing numbered highways, was the basis for what the company described as the first successful copyright infringement suit involving a road map.66

As Rand McNally's map, atlas, and globe business grew, and as the number of employees working on research, compilation, drafting, and printing grew, the company became more systematic in procuring patents and copyrights and obtaining assignments of all patents and copyrights from their employees and independent contractors. In many cases, Rand McNally credited authors or editors of books, but not in every case.67 The multiplicity of contributors as its products built on the work of more and more people may have explained
why individual attributions were not made. The description of the cartographer who supervised the development of Rand McNally’s new system of air route maps in the early days of aviation shows how, in a collaborative and multilayered product development process, individual attributions could and could not be made.

In 1928, just as Rand McNally’s first series of automobile road maps was declining as a source of revenue because gasoline companies were distributing them for free, the company began to market “Air Trails Maps” for the navigation of airplanes. The first step in the development of the map was to compile a file of all U.S. airports, which numbered about 1,500 in the mid-1920s. Rand McNally employees mailed questionnaires to every airport, requesting full information as to facilities. Then the information was added onto the company’s “Standard Indexed Pocket Maps,” which were an established and familiar product to many, and which also had the advantage of being constructed on a projection that was ideal for solving air navigation problems. The Air Trails Map had the standard state map on one side and the same map overprinted with aeronautical data on the verso. The index booklet that accompanied each map was enlarged to include the airport directory that had been compiled from the survey along with a discussion of the existing aids to navigation such as beacons, radio stations, elevations, and airways. Authorship was credited only to a small part of the overall project: an eight-page treatise on the “Elements of Practical Air Navigation” attached to the map which stated that it had been compiled by Thoburn C. Lyon, a Rand McNally employee who supervised production of the maps. It is unclear whether Lyon was credited because he actually researched and wrote the text or because he supervised others who did and had the status within the firm to demand attribution.

Within the company’s internal culture of recognition, there seems to have been a hierarchy, and the hierarchy was at least in part quite gendered. In the early to mid-1920s, the head of the company’s editorial department was a “Miss Hammit,” the heads of the map coloring department and the map indexing department were also women, and many if not most of the employees in the map indexing and map coloring departments were women. Male cartographers were identified by name within and outside the firm; women remained more anonymous. Contributions of the many women employed at Rand McNally were rarely acknowledged in the copyright applications or elsewhere, except in the reminiscences of individual employees. It may be that their contributions were less significant, and that women were employed more in the role of office managers and draftspersons rather than as cartographers, but it may be that the men who devised the marketing
materials and internal company documents simply could not imagine the contributions of the women to have been significant. Thus, even as credit began to replace intellectual property ownership as one of the chief markers and rewards of innovation in the twentieth-century corporation, it also appears that who was credited remained a function of social status.

Employment and Authentic Creativity in a Consumer Culture

As innovative firms were reorganizing into increasingly large corporations and as legal doctrine was changing, the kinds of works that were subject to intellectual property protection changed too. Increasingly firms created products for the rapidly expanding consumer culture. And the employees who made the products were consumers too. As consuming replaced producing as the principal marker of social status, both lawyers and society at large shifted their views about the nature, causes, and use of innovation and technological development. Innovation could produce new consumer goods (like cameras and small household appliances), not just new technologies to improve manufacturing or transport (like heavy machinery and locomotives). Innovation came to be seen as something firms marketed to consumers (“Get the new and improved —-!”). Companies advertised how their scientific research would improve the quality of their consumer products and, therefore, their consumers’ lives. As Du Pont said, “Better living through chemistry.” Intellectual property rights expanded to include more material produced by employees for consumers, and employment law changed to accommodate the expansion of intellectual property. Meanwhile, firms began to market their innovative products with brand names that they hoped consumers would take to be the gold standard for whatever general sort of item the company was selling (“Kodak is photography”) and to use selective attribution of their products to particularly innovative employees whenever the company’s advertising directors deemed it necessary to convince consumers of the quality, creativity, and authenticity of their products (hence photos of Thomas Edison with “his” lightbulb or phonograph, or Alexander Graham Bell with “his” telephone, or Paul Goode with “his” maps).

Deciding what kinds of materials could be treated as intellectual property became ever more difficult as the subjects of copyright protection expanded from books into new media. Questions naturally arose: Is it the idea or the expression that is protected? What is it about a particular work that makes it appropriate to grant a monopoly over its use? If rewarding and encouraging creativity were crucial in justifying the existence of copyrights at all, it became all the more important to identify and lionize the originator. To the extent that property rights are justified by the moral superiority of the

The Corporation's Money Paid for the Painting
individual artist, corporate authorship is troubling. But to the extent that intellectual property rights exist to encourage investment in intellectual endeavor, corporate authorship is essential.

This difficulty of reconciling corporate ownership and individual artistic expression is evident in Justice Holmes's opinion for the Supreme Court in *Bleistein v. Donaldson Lithographing Co.*[^69^] *Bleistein* was a major event in copyright history, not only for its well-known ruling on the scope of copyright but also as the first case in which the Supreme Court recognized the employer as the author of a work made for hire. The Court held that three chromolithographs prepared by employees of a corporation for use as advertisements were proper subjects for copyright protection.

*Bleistein* was an action brought by six partners of an unincorporated lithographic and printing firm, Courier Company, in Buffalo, New York. Courier employed a few men on a $100 weekly salary to design commercial artwork for use as advertisements. The particular works in question were designs used as posters to advertise a circus. Courier had no written contracts with the designers; as Bleistein testified: “He is an employee. . . . [W]e engage his talent and his services and pay for them. What he does produce belongs to us, because we pay for it to him.” When asked whether the designers had written employment contracts or any other written agreement transferring the rights to their designs to the firm, Bleistein said they did not; “We simply pay for his talent . . . and what he produces belongs to us.”[^70^] Courier copyrighted its employees’ designs and then entered into agreements with clients promising to produce a certain number of posters using Courier’s copyrighted designs. Under the agreement, the client would get the exclusive use of the design for a specified period, but thereafter the Courier firm would be entitled to use the design for other clients. When Donaldson, a Kentucky lithography firm, produced posters using a similar design, the Courier partners brought suit alleging copyright infringement.

On appeal, the principal issue was whether commercial artworks of the sort in issue were a proper subject of copyright. Justice Holmes justified copyright protection on the basis of the artistic genius and the uniqueness or singularity of the “personality” expressed in the works by the artist. In determining that a lithograph for use as an advertisement was the sort of creative work that should be accorded copyright protection, Holmes wrote a paean to the individuality of artistic genius. If commercial art were not copyrightable simply because it was intended to be more realistic than high art, it “would mean that a portrait by Velasquez or Whistler was common property because others might try their hand on the same face.”[^71^] Holmes insisted that even realistic pictures intended to portray actual persons for commercial purposes

[^69^]: Bleistein v. Donaldson Lithographing Co.
[^70^]: Bleistein v. Donaldson Lithographing Co.
[^71^]: Bleistein v. Donaldson Lithographing Co.
were “the personal reaction of an individual upon nature. Personality always contains something unique. It expresses its singularity even in handwriting, and a very modest grade of art has in it something irreducible, which is one man’s alone. That something he may copyright unless there is a restriction in the words of the act.”

Given the importance Holmes ascribed to the role of the artist, it is interesting that he found employer ownership of copyright to be entirely unremarkable. The fiction that the employer was the author, without even the necessity of the assignment of the copyright from the artist to the firm, allowed Holmes to elide the question of how a corporation or partnership could be entitled to copyright an advertisement if the justification for the copyright is “the personal reaction of the individual upon nature.” The legal fiction of employer authorship had a greater impact on lived experience than many legal fictions, however, for it reoriented the relationship between creative employees and the firms for which they worked.

Holmes’s opinion in Bleistein is more commonly read as a case about the expanding scope of copyright to include popular and commercial media than it is as a case about corporate authorship. But it is necessarily a case about both. Holmes made it clear that the question of corporate (or employer) authorship of creative works was part of the case by citing both Carte v. Evans (the case involving the arrangement to the Mikado) and the Colliery Engineer decision about the ownership of materials for a correspondence course. He invoked the traditional notion of authorship as artistic creation—“the personal reaction of an individual upon nature”—while giving it an entirely new significance: corporate authorship of advertisements. To expand copyright protection into new media, he equated the art of Goya, Velasquez, Whistler, and Manet with commercial advertising. He did so precisely because giving new content to the old form of authorship was an effective rhetorical strategy to expand copyright protection. By eliding the distinction between the legal fiction of corporate authorship and the fact of collaborative creation in a corporate setting, and by effacing the (ever-shrinking) difference between advertising and art, Holmes made a significant change in doctrine while seeming to do nothing more revolutionary than drawing a simple analogy.

The notion of copyrighted advertisements was not without detractors. Justice Harlan’s dissenting opinion asserted that an advertisement could not be copyrighted because it was not “art” and lacked sufficient “connection with the fine arts to give it intrinsic value.” Harlan’s opinion, which was largely a long quotation of the opinion of the court below, reflected a view that copyright and other intellectual property rights ought to be limited to important and genuinely distinctive creations. The mass of goods produced

The Corporation’s Money Paid for the Painting
for consumers and the growing advertising machinery for selling them simply did not fit this understanding of the lofty nature of intellectual property. Harlan was not so much a defender of the public domain as a snob about what kinds of things are sufficiently worthwhile so as to deserve the label of property.

Harlan was on the losing side of modernity’s battle over the popularization and commercialization of art. Art had aesthetic value if people liked it; aesthetic value was reflected in what people would buy. Intellectual property law did not exist to demarcate the line between the worthy and the unworthy, or to reward genius, but, rather, to provide a return on investment in generating ever more goods for consumers. Holmes rejected Harlan’s view of the proper scope of copyright law as leading to unacceptable censorship by a judiciary ill-equipped to distinguish art from commerce:

It would be a dangerous undertaking for persons trained only to the law to constitute themselves final judges of the worth of pictorial illustrations, outside of the narrowest and most obvious limits. At the one extreme, some works of genius would be sure to miss appreciation. Their very novelty would make them repulsive until the public had learned the new language in which their author spoke. It may be more than doubted, for instance, whether the etchings of Goya or the paintings of Manet would have been sure of protection when seen for the first time. At the other end, copyright would be denied to pictures which appealed to a public less educated than the judge. Yet if they command the interest of any public, they have a commercial value,—it would be bold to say that they have not an aesthetic and educational value,—and the taste of any public is not to be treated with contempt. It is an ultimate fact for the moment, whatever may be our hopes for a change.76

Of course Holmes oversimplified to make his point: copyright eligibility depended on more than the taste of the public. As James Joyce discovered in the fracas over the American publication of Ulysses, a work must be published in the United States to be copyrighted, and as his book was censored for a time it did not initially receive an American copyright.77

The expanding realm of copyright became a subject of art, not merely the legal regime that reacted to it. As Paul Saint-Amour has shown, a number of prominent writers and critics in the late nineteenth and early twentieth centuries made the scope of copyright and the question of originality part of their literary subject.78 And they did not just advocate for greater copyright protection. Certainly many celebrity authors did, then and now. But some

CORPORATE INTELLECTUAL PROPERTY
were quite concerned about the impact of extensive copyright protection on the public domain from which many drew their inspiration.

What did it mean to creative workers whose employers increasingly claimed copyrights on their work? Their voices are not preserved in the cases or company archives. It is possible that the anonymous draftspersons and lithographers whose work was the subject of the Bleistein litigation felt valorized that their work became intellectual property, and thus occupied the same legal category as a book, a painting, or a symphony. On the other hand, they may, like the Du Pont experimental employees described in the last chapter, have felt that their ideas and expression had been taken from them unfairly with too little credit to them.

The consolidation of the regime of corporate intellectual property fundamentally changed the way corporate managers and employees, as well as lawyers and judges, regarded workplace knowledge. Ideas became property and employee knowledge became a corporate asset. Creativity, or even the capacity for creativity, was commodified as another form of wealth; it became human capital. And once it was thus commodified, judges easily added it to other corporate assets. Yet neither firms nor courts were willing to sever the connection between real people and corporate intellectual property. The authenticity, and therefore the desirability, of fabricated cultural commodities necessitated that a real person be associated with a creative work. Firms maintained the connection by attributing products to their workers. Courts did it by rejecting the most aggressive efforts to declare workplace knowledge to be a trade secret, or by preventing an unconsenting employee’s name from use as a company trademark, and sometimes by refusing to enforce expansive copyright and patent assignments. But, for the most part, the search for authenticity in the mass of expanding corporate intellectual property was conducted outside the realm of law.
CONCLUSION

Attribution, Authenticity, & the Corporate Production of Technology and Culture

The growth of corporations and the rapid spread of office and factory work significantly changed the application of legal rules regarding intellectual property ownership. As is always the case with law, the changing applications ultimately changed the rules themselves. As the settings in which ideas were manufactured became more “corporate”—more bureaucratic, more collective, and, quite literally, under the aegis of corporations—and as the claimants to idea ownership increasingly were corporations, what judges thought of idea ownership and how firms managed creative employees changed too. Judges came to believe that people learned workplace skills in large offices and factories rather than as apprentices in small workshops or as clerks in small offices. At the same time, judges developed a view of contract law generally, and the employment contract specifically, that operated both as a conceptual technology and as a mechanism of social control to enable a shift in idea ownership. The old legal conception of individual invention (and, therefore, individual ownership) seemed anachronistic. The acceptance of corporations as legal “persons” with all the rights and privileges of personhood provided a new legal framework to reconcile the traditionally individualist presuppositions of patent and copyright law, which focus on the author or the inventor, with the new social reality of collective innovation. The cultural change and the legal change coincided and reinforced one another in ways that naturalized the radical developments and made a revolution seem normal, inevitable, and uncontroversial.

The Dependent Corporate Engineer and the Modern Middle Class

By the third decade of the twentieth century, creative and educated people of scientific or technical skill who worked in business rather than academia had
become employees of a big corporation in the middle layers of a large bureaucracy. For the most part, they no longer had either the option or the obligation to parlay their scientific knowledge and business acumen (if they had any) into a successful business venture; they could count on their positions as respected researchers at prestigious corporations and their stable corporate salaries for their social status. They enjoyed some measure of security, but not the kind of power or the opportunity for tremendous financial gain that the lucky and enterprising inventor had enjoyed fifty years before.

The triumph of the mid-twentieth-century employment contract was to elevate inventive workers to a position of safe dependence amid the prosperity and job security that characterized white-collar male employment at the major American manufacturing firms. What had been risky became safe. The erratic but brilliant hero-inventor yielded his place to the competent, diligent, slightly dull, consumer-oriented 1950s company man. Companies like Kodak and Du Pont became exemplars of midcentury corporate technology giants: large, risk-averse, and generally not the place for an entrepreneurial young scientist or engineer to make a major breakthrough. There were dramatic inventions—vinyl, nylon—but they were corporate feats, not the achievements that created an individual legend like Bell’s or Edison’s.

Decades later, looking back over the course of the twentieth-century transformation of invention from a world of entrepreneurship to a world of stable corporate employment, judges expressed both anxiety about whether corporate research sufficiently promoted individual ingenuity and nostalgia for an imagined past in which great inventors could become great leaders. As the New Jersey Supreme Court noted in one of the leading cases on pre-invention assignment agreements, Ingersoll-Rand v. Ciavatta (1989), there is a “dichotomy of our views on the rights of an inventor and rights of an employer.” The court expressed concern that employer control over inventions was fueling an alleged decline in patenting by Americans. Justice Garibaldi’s opinion for a unanimous court contrasted a stagnant America with the then ascendant Japan, noting that Japan had “witnessed a dramatic increase in the number of inventions generated by employed inventors” after the adoption of a 1959 law that tied employed inventors’ compensation to the market value of their inventions. The story behind the case justifies the court’s wistful view about the loss of the entrepreneurial spirit at major American manufacturing firms and the dependence of inventors on corporate employment.¹

A New Jersey company founded in 1871 by a number of inventor-entrepreneurs who parlayed their inventions and business acumen into a successful firm based on new technology using compressed air, Ingersoll-Rand eventually became a large, diversified manufacturer of heavy equipment.

Conclusion
power tools, locks, and a wide array of machinery and parts for the auto, construction, and industrial equipment industries. In the early twentieth century, Ingersoll-Rand drills were used on the construction of the New York subway, the Panama Canal, the Hoover Dam, the Cascade Tunnel (then the longest mountain railroad tunnel on the North American continent), and Mt. Rushmore. Just as notably, Ingersoll-Rand patented the original jackhammer. An 1887 Scientific American article on the construction of the New York aqueduct reads like an advertisement for Ingersoll drills. As the New York Times obituary of one company founder breathlessly explained in 1907, “It was his development of the drill which made possible many of the great engineering feats of the last century and those now in progress.”

The early history of the companies that eventually united to form Ingersoll-Rand was characterized by a combination of the mechanical ingenuity of the founders with the business acumen necessary to make the patented inventions a success in the marketplace. Simon Ingersoll invented and patented a rock drill that became the foundation of the company’s business. He sold the patents to the firm he founded in 1871. He himself never enjoyed a large share of the wealth generated by the company that bore his name because he had sold his patents to the firm. Henry Clark Sergeant received over sixty patents for various inventions and is credited with the innovation that made the rock drill successful. He formed his own company to market his inventions, and that company eventually merged with the Ingersoll Drill Company in 1888; the Ingersoll-Sergeant Company specialized in tunnel driving and quarrying. Meanwhile, brothers Albert, Jasper, and Addison Rand founded a firm specializing in mining work based on their own, independent drill technology. When Ingersoll-Sergeant merged with Rand in 1905, the announcement of the merger focused on the uniting of the patents as much as anything else.

If the early success of the firm exemplified the happy marriage between invention and entrepreneurship that characterized many nineteenth-century technology businesses, the history of the firm in the first several decades of the twentieth century exemplified the life story of the large, vertically integrated, and massively diversified manufacturing corporation whose fate was linked with capital spending in American manufacturing, construction, and mining. By the mid-twentieth century, although it was still possible for a talented man to rise in the ranks from a low-level technical position to the top of the corporate hierarchy, entrepreneurial possibilities for R&D people were very limited and were systematically discouraged by the company’s practice of demanding assignments of all employee patents while failing to develop some product ideas that many employees believed to be promis-

Conclusion
ing. In the 1990s, Ingersoll-Rand's chairman quipped to Forbes magazine, the firm was “not a glamorous company.” The corporate R & D experience turned the mechanical engineer from the hero of midcentury gee-whiz feats of construction marvel into the man in the gray flannel suit. By the 1970s, promising young engineers shunned that sort of boring job security in favor of the high-risk, high-reward start-up mania in the field of computer engineering in Silicon Valley.

Those at Ingersoll-Rand who sought to strike out on their own as entrepreneurs encountered legal obstacles in their path. Armand Ciavatta was among them. The son of a working-class Italian American family from New England, Ciavatta worked for Ingersoll-Rand from 1972 until he was fired in 1978 in a dispute about the quality of devices for stabilizing mine roofs, a product for which Ciavatta was the manufacturing manager. Several years before, while Ciavatta was employed in the research division of Ingersoll-Rand, he had signed an agreement promising to assign to the company any inventions he might make during his employment or for a year thereafter that "relates to... the business of [Ingersoll-Rand] or any of its affiliates." Ciavatta had bubbled with ideas during his early years at Ingersoll-Rand and had submitted thirteen ideas for inventions to his superiors. The company declined to pursue any of his concepts, so Ciavatta lost the motivation to invent and did not submit any further ideas. As others described the anemic research culture at Ingersoll-Rand and similar companies, the problem was that cautious managers found it easier to nix innovative product development ideas than to pursue them and risk the embarrassment and career setback of a flop. The corporate R & D culture became focused on weeding out poor ideas that would fail when they hit the market after years of expensive development. As one engineer described it, the marketing department might dream up a product and "toss the idea over the wall" separating marketing and engineering. Engineering would work up a design and toss it over another wall to the manufacturing department that would make the product and then heave it over yet another wall to sales. Too often, engineering would toss the idea back to marketing because the engineers considered the idea unworkable, or manufacturing would return an idea to engineering for reworking when they thought the design or the prototype was flawed. By the 1980s, Ingersoll-Rand executives had become so concerned about product development that they initiated a major overhaul to try to reunite the innovative and the entrepreneurial.

While unemployed after his termination from Ingersoll-Rand, Ciavatta went back to tinkering. Standing on a ladder installing a light fixture in his home, he came up with an idea for a new mine roof stabilizer. He developed

**Conclusion**
a prototype with kitchen utensils borrowed from his wife and the assistance of a neighborhood boy. Investing his life savings, along with money borrowed from a bank and from his brother, Ciavatta patented his stabilizer and started his own small business to market his invention. When Ciavatta's stabilizer proved a success in the marketplace, Ingersoll-Rand sued to force him to relinquish the patent. Although Ciavatta eventually won the litigation in a unanimous decision of the New Jersey Supreme Court, the long legal fight and Ingersoll-Rand's massive power in the marketplace eventually drove Ciavatta's product out of the market and his company into ruin.

Armand Ciavatta's fight against Ingersoll-Rand occurred in the early 1980s as American corporate employment and innovation were undergoing seismic shifts. The stability of corporate jobs was disappearing as firms faced new global competition and unprecedented pressure from Wall Street to boost share prices by reducing labor costs. Corporate R & D departments were often targeted because they were perceived by cost-cutting management consultants as being too bureaucratic, too expensive, and insufficiently creative and entrepreneurial. Firms that had once offered stable jobs in exchange for long-term loyalty of their employees began laying off employees by the thousands and insisting that workers be much more entrepreneurial. As the vice president of human resources at AT&T said in 1996 when the firm announced a plan to eliminate 40,000 jobs, "People need to look at themselves as self-employed, as vendors who come to this company to sell their skills. . . . [W]e have to promote the whole concept of the work force being contingent." Yet the contracts that these companies' lawyers had drafted for employees to sign made it quite difficult, as Armand Ciavatta found, to be entrepreneurial. Ciavatta was the company man without a company at a time when secure corporate jobs for middle-aged engineers were becoming harder to find. He never did find another stable job.

When the legal and business regulation of workplace knowledge was being cemented in the late 1920s, there was little awareness of how precarious workers were in their dependence on corporate employment, given the legal regime that made it difficult for employees to use their knowledge entrepreneurially. Such awareness was at least fifty years in the future. The expansion of the American economy in this period, outside of the seismic dislocations of the Great Depression and the recessions of the 1970s and 1980s, could have led lawyers, judges, and employees to the conclusion that the implicit exchange of stable employment for employer control of workplace knowledge was a good deal for inventors and authors. Although modern

Conclusion
management of intellectual property reduced the independence and upward mobility of inventive employees, even the architect of modern management, Frederick Winslow Taylor, astutely recognized the importance of employee attitudes in enabling firms to control their employees' work to an extent that might otherwise have been fiercely resisted. In describing his own experiences reworking the management of employees and production at Midvale Steel, he recognized that one's ascribed class position based on education or family background can cloud everyone's perception of the worker's actual position within the hierarchy. Writing about himself in the third person, Taylor confessed, "[O]wing to the fact that he happened not to be of working parents, the owners of the company believed that he had the interest of the works more at heart than the other workmen, and they therefore had more confidence in his word than they did in that of the machinists who were under him." Taylor saw this, but nowhere in his Principles of Scientific Management: did he suggest the enormous impact scientific management might have on the prospects of the sons and daughters of "nonworking" parents like his.

As workplace knowledge became corporate intellectual property, the combination of new legal and business practices transformed not only work relations but also class relations for creative people. Yet, as befits a not strictly material form of property, the relation between the new intellectual property ownership and class is symbolic as well as material. The creation of social class is like gazing into a distorted looking glass: as Pierre Bourdieu said, when each of us sees a description of our social position as a representation of ourselves, we create a class. Neither the working class nor the middle class exists ready-made in reality; they are historically variable creations of "material and symbolic struggles waged simultaneously over class and between classes." Such a material and symbolic struggle over ownership of ideas occurred among lawyers and judges, employees and managers. In material terms, the reallocation of intellectual property rights from employees to firms reduced the opportunities for entrepreneurship and the economic wealth it might bring. When creative employees acceded to corporate ownership of intellectual property, they became a new middle class. In symbolic terms, the dependence on corporate employment, the characterization of oneself as part of the company research team rather than as the inventor, transformed the class identity of the inventive employee. When judges described them so, and when inventive employees saw themselves so, they became a new middle class.

Changes in legal doctrine, along with many more significant changes in corporate practice, contributed to a fundamental change in the nature of

Conclusion
the middle class. Many have argued—most famously, C. Wright Mills—that the early twentieth century witnessed the creation of a new middle class, distinct from an old middle class of independent entrepreneurs. Among the many facets of this change was an “occupational transformation” associated with “the systematization of knowledge in universities and the ensuing certification process.” This new middle class was “a mental rather than an occupational category” in the sense that the employees in question were, as before, technically trained engineers who worked for firms to develop new technologies. The difference was in the diminished independence and entrepreneurial prospects of the twentieth-century employee-inventor.

Class is a function of many things; education and wealth are part of it, but economic power, social stature, and self-conception are too. Both Walter Masland and Edwin Prindle saw quite clearly how company ownership of employee intellectual property diminished the class position of well-paid and highly educated men whose education and compensation might otherwise have put them relatively high in the ranks of the middle class. Du Pont’s insistence that it owned every new idea, every patent, and every secret process its employees might develop may have been desirable to encourage technological development, but it limited employees’ prospects as entrepreneurs. To some, it was also an affront to their dignity. They were parts of the Du Pont team, but they were not independent. Although they were chemists with Ph.D.s, they were going to remain all their lives as wage earners. They were in the same position as the working class—dependent on wages or salary without prospects for upward mobility and eventual independence. They were the elite of the middle class, but corporate ownership of their intellectual property was the difference between independence and dependence, and that was a crucial difference. They traded the status of the small-time independent entrepreneur for the economic and social security of a company man at a leading corporation. They were the new middle class, and their relationship to their companies’ intellectual property was part of what made them who they were.

It is perhaps not too much an oversimplification to treat the independent inventor-manager and the small-scale entrepreneur as the archetypes of the nineteenth-century inventive man and “old” middle class, and Walter Masland and Armand Ciavatta as the archetypes of the twentieth century’s new innovator and “new” middle class. The courts’ use of the rhetoric of contract and the legal fiction of consent effected a legal change that both facilitated and reflected the changing corporate practice and thereby brought about the social change. Of course, companies’ strategies toward innovation mattered as well. Railroads, for example, innovated within a limited range;

Conclusion
they did not, particularly at the end of the nineteenth century, aim to develop radically new technology or significant innovations on existing practice. Du Pont, by contrast, did, especially after 1902. Thus, a firm’s attitude toward employee intellectual property and entrepreneurship is in part a function of the economic strategy it and its competitors choose. A company such as the Reading Railroad might discourage employees from innovating in ways that would threaten the push toward uniformity and toward maximally efficient use of the existing structure. This strategic choice might lead a firm, as it did the Reading, to adopt a rather casual attitude toward controlling employee intellectual property. Du Pont, by contrast, proved willing to diversify away from its core business (explosives) in radically new directions (chemicals, then textiles, paints, plastics, etc.). The pursuit and control of new technology as a corporate strategy led Du Pont into a different relationship with its employees, and it used law in different ways than railroads did to facilitate that strategy. The steady growth of Du Pont and the steady decline of the railroads seemed an implicit argument about the superiority of the one regime over the other, until the globalization and the Silicon Valley phenomenon made people wonder about the future of large corporate innovation.

Yet even different strategies regarding innovation ultimately seem to have mattered less than the development of bureaucratic employment practices and an effort to standardize intellectual property policies. During the first two decades of the twentieth century, railroads seem to have changed their policies and contracts vis-à-vis employee inventions in a manner similar to the changes at Du Pont. As Naomi Lamoreaux and Kenneth Sokoloff have documented, the Pullman Company began to revise its practices for evaluating employee inventions in 1912 by establishing a Committee of Standards to evaluate both employees’ and outsiders’ inventions, and it adopted a policy to require employees to “give the Company preference in disposing of the title to such invention and the patent therefor, in addition to the shop-right which the law implies.” As Lamoreaux and Sokoloff explain, the company offered to pay a bonus of $250 for any employee invention the company patented, which was “a radical and unilateral change in the nature of the employment contract.” Though the bonus offer was articulated as an effort to encourage innovations by employees, “the purpose of the policy was to impose restrictions on employees’ behavior.” Firms encountered significant difficulty in persuading employees that new policies such as that adopted by Pullman were in their interest. Under this thinking, employees stood to benefit from trading their entrepreneurial potential, as expressed by retaining one’s patents, for a job within a single firm that would be assigned those very same patents.

Conclusion
But Du Pont, Kodak, and Ingersoll-Rand employees, and others like them, were in a distinctly different position. The separation of management from innovation enabled courts to say that their employment agreements accorded their employer many more rights to the products of their labor and ingenuity than employers previously had enjoyed. Courts began to see that invention, like any other form of labor, could be commodified; therefore, an employee hired to “improve” a business necessarily was hired to invent.

Ultimately, corporate control over intellectual property changed inventive employees’ perceptions of their own status. Masland left Du Pont because he despaired about rising in the firm. He was acutely aware of the dependence of inventive employees and he did not want to be a cog in the Du Pont machine. Complaints about the lack of prospects for advancement and about Charles Reese’s condescending attitudes reveal their anxiety of status. The dependence that troubled Masland and many others of the era was not merely economic dependence but also the loss of his identity and being submerged into the corporation.¹⁹ What could be a more acute experience of the loss of self than being told that your ideas, your inventions, and even your knowledge were your employer’s, not yours?

Entrepreneurial prospects were not the only difference between the class positions of creative employees in the nineteenth century and in the twentieth; supervisory responsibility was also important. The supervisory position of an inventor-manager gave him control over the use and development of his ideas; Masland had much less. That fact may have affected an inventor-manager’s ability to exploit his own invention, even if his employer might otherwise have been inclined to claim the patent for itself. So, too, it may have affected what the employee and the firm understood the employment agreement to encompass, by giving him greater bargaining power and by making him seem to be a man of greater stature within the organization. Stature within an organization is one thing that distinguishes the upper and upper-middle classes from those solidly in the middle class.

The existence of supervisory responsibility affected more than the inventor’s perception of his status, and more even than his ability to exert leverage in his negotiations with his employer. It also affected how judges saw employees. The specialization of invention in the large corporate R & D facility constrained the negotiations between employer and employee, shaped the perceptions of each when no explicit negotiations occurred, and ultimately changed the perceptions of courts in allocating rights when negotiations had not occurred. Rare would be the person like Thomas Edison, who after founding his “laboratory” at Menlo Park in 1876 remained active as a researcher

Conclusion
and inventor while managing the enterprise and keeping a substantial ownership stake in the firm.\textsuperscript{20} In the nineteenth century, judges often emphasized the independence and ingenuity of the creative employee. Judges did not see inventive employees as part of the dependent working class, and middle-class status connoted independence. Independence required the possibility of being an entrepreneur based on inventive ideas. Consequently, judges concluded—sometimes in the teeth of the facts—that employment contracts contained implied terms allocating intellectual property rights to employees. Judges’ perception of the perquisites of the employees’ middle-class status vastly increased the employees’ chances of becoming entrepreneurs if they were not already. Mid-nineteenth-century judges seized upon the employee’s having allowed the employer to use the invention as a basis for employer ownership. Later judges emphasized that the employer’s time or materials had been invested in the project, that the employee had allowed or encouraged the employer to use the invention, and that the employee had implicitly contracted for employer control of the intellectual property.\textsuperscript{21} As the Wisconsin Supreme Court said in 1887, the origin of the idea is less important than “[t]he mere fact that, in making the invention, an employee uses the materials of his employer, and is aided by the services and suggestions of his co-employees and employer in perfecting and bringing the same into successful use.”\textsuperscript{22} Yet many judges clung to the view that an employee’s ideas were inalienably his. The Wisconsin Supreme Court dismissed the claim that the employer’s contribution of material and labor entitled the firm to own the product: it “confound[s] the machine with the invention that it embodies. Of course, there must be a machine which will operate before it can be patented. That implies material, workmanship, and skill combined. But such combination itself is not enough to secure a patent.”\textsuperscript{23} Because the employee supplied the idea, the employee should own the patent. It was in the twentieth century, when judges imagined firms as originators, or at least essential incubators, of the idea, that the position of the inventive employee changed. That change in thinking required a significant re-imagining of the status and nature of inventors.

The creative employees represented in this narrative by the nineteenth-century inventor-managers represent the best case of free labor. They were autonomous and upwardly mobile because they owned the fruits of their creativity. As firms increasingly were able to control ownership of intellectual property, they limited the entrepreneurial prospects of their employees. Innovative employees became, at most, middle managers; they did not

\textit{Conclusion}
become business owners themselves. And even as middle managers, they enjoyed fewer entrepreneurial opportunities and less autonomy than the middle managers of the nineteenth century. Legal rules thus facilitated the redefinition of the middle class in the early years of the twentieth century, helping to transform America from an economy of small entrepreneurs to an economy of corporations. Legal rules were one of the social and economic factors that shaped the middle class—that “ambiguous and shifting middle zone of social and political space” that today seems to encompass the identity of 90 percent of the American public.\textsuperscript{24}

At the turn of the twentieth century, technology firms presented themselves as the embodiment of the ambitions and sagacity of their founders and investors. Technology employees felt ill-used by firms that built their name on the talent of their employees but sought to claim ownership of that talent exclusively for the firm, even if the corporate claims were consistent with what the law would allow. It was the failure to give credit that led some engineers derisively to claim that corporate research and development did not reflect a spirit of cooperative investigation, as claimed by the R & D managers, but rather, as a later critic described it, a regime “of collective subservience.”\textsuperscript{25} No one doubted that the growing complexity of science and technology had rendered invention increasingly a collective rather than a solitary activity, and that the efforts of many contributed to the developments of patentable technology. Nor did scientists and technicians working in research facilities underestimate the risk of opportunistic behavior: as one person sought to claim more credit for inventions than his contribution might merit (whether the credit was being named on a patent, recognized in a company bulletin, or collecting a financial bonus). It was the power relations within the hierarchically organized corporation that seemed to irk employees the most—the fact that the director of the research lab could get away with claiming significant responsibility for an invention that in fact was developed by others. Moreover, the bureaucratic direction of creativity—you must work on this line of research or you must abandon that one—seemed a denial of autonomy. People whose graduate education inculcated in them the belief that they were men of status and independence found themselves cogs in the corporate scientific wheel. They realized that they had traded freedom and the possibility of entrepreneurship for the stability of a corporate job and the comforts of a well-equipped lab. The legal rule that facilitated corporate ownership of patents, combined with the social changes that brought corporate control of the decision when, whether, and on what to seek a patent, played crucial roles in this fundamental change in the status of a scientist.

\textit{Conclusion}
or inventor. Law and corporate culture together created a new segment of the middle class.

Work relations vis-à-vis intellectual property changed just as intellectual property gained salience in the consumer culture that developed so rapidly after the turn of the twentieth century. The organs of popular culture—advertising, magazines, radio, and mass communication—increasingly emphasized consumption rather than production or “industry” (in the sense of diligent work) as a most desirable form of human activity. The plethora of consumer goods and the new media that sold them led to an explosion in the kinds of ideas for which intellectual property status was claimed. Copyright was no longer just for books and maps, as it had been in the early nineteenth century, but was claimed for advertisements, recorded music, photographs, and film. Simultaneously, the technology that could be patented grew in scope and complexity. In both areas, the knowledge that employees possessed—and that employers sought to protect as intellectual property—became ever more likely to be collectively created in a commercial setting. At the same time, consumer culture diminished the moral and social value of labor as opposed to the moral and social value of consumption. This in turn changed how judges and lawyers defined and justified intellectual property rights. As the boundaries of intellectual property grew, and as the creation of intellectual property simultaneously became ever more collective, courts, firms, and the people who populated both sets of institutions came to think differently about how to draw the line between corporate intellectual property and employee knowledge.

Attribution as the New Intellectual Property and the Search for Authenticity

People throughout history have valued the reputations they gain by associating their names with their work; great artists of all kinds have destroyed work that they thought did not measure up to their standards, even when they might have profited more (at least in the short term) from selling their lesser works rather than destroying them. Nineteenth-century courts were aware that equating intellectual property ownership with attribution had both intrinsic and instrumental motivations above and beyond the economic value of property rights themselves. Intrinsically, it acknowledged the moral value of creativity. Instrumentally, it encouraged creativity by linking the honor to the actual creator rather than to the firm. Scholars and judges of the early twentieth century feared that corporate intellectual property ownership would undermine the reward function of attribution. This was
part of a more general concern that large firms threatened entrepreneurship because creative and potentially entrepreneurial people might believe their own work and risk-taking could go unnoticed or unrewarded. The influential economic theorist Joseph Schumpeter believed that “[i]n the modern corporation, entrepreneurial gains are as a rule merged with many other elements into the profit item, and the individuals who fill the entrepreneurial function are separated from them—accepting the salaries and other prerequisites of executives in lieu of them.” He worried that bureaucratization of the entrepreneurial process would undermine the will to overcome resistance to change and lead to a decline in entrepreneurship. As Schumpeter correctly predicted, the challenge of the twentieth century was to preserve the entrepreneurial spirit within the harness of bureaucratic work.

By the end of the twentieth century, corporate intellectual property ownership became the norm and individual invention and authorship the exception. The late twentieth-century erasure of the natural person’s name from the responsibility for innovation has dehumanized intellectual property and the ideas and work embodied in it. Yet the moral claims of corporations as intellectual property rights holders still are not as persuasive as the claims of individuals. So when the Disney Corporation seeks yet another extension of the term of copyright, they bring out creative individuals—Arnold Schoenberg’s grandchildren, Bob Dylan—as their advocates. And when the Motion Picture Association of America launched a major public relations initiative in 2003 to discourage unauthorized copying of DVDs, they used the working man to state their case that piracy is bad. Clearly the MPAA knows that it cannot rely solely on the dire FBI warnings that precede every DVD because viewers regard them as just so much noise. So the MPAA, through an organization called Respect Copyrights, ran a series of short “public service” films before the previews in movie theaters featuring a worker who contributes to the making of a film (a set designer, a stuntman). The workers describe how they feel about their contributions to the movie, how important their hard work and talent is to the success of the movie, and how piracy in effect steals “their” property.

Consider the spot featuring the set builder David Goldstein. Goldstein, a nice-looking guy wearing a well-worn shirt, was filmed talking about his work in front of a row of shelves holding paints and set construction materials. Piracy, he says, is bad because it doesn’t really hurt the producers, or, he corrects himself, it “does affect the producers, but it’s minuscule to the way it affects me, the guy working on construction, the lighting guy, the sound guy.” There follows a montage of the great movies he’s worked on, with his voiceover saying he met his wife making The Big Chill. Then he looks quite

**Conclusion**
heartfelt and says, "I'm not a million dollar employee. . . . I'm lucky if I can put together twelve months of work in a year. All I want to do is do the best product I can." The honest labor of a guy in work boots and a flannel shirt, a man who is paid by the hour or the day and will never see a penny of royalties produced by the film's copyright, is the movie studio's best moral claim to own the work he generates.30

Goldstein's reminiscences about meeting his wife while working on the set of The Big Chill invites viewers to form an emotional bond linking their sentimental feelings, evoked by the wildly popular movie soundtrack of Motown songs, with his sentimental feelings about the community of set builders, electricians, costume designers, and actors who worked together to create the movie. Thus, Goldstein enables us to see The Big Chill as something we all share, and to see how pirating it becomes hurtful in a personal way. It is the movie studio's investment, true, but that investment is made to represent the creation of community that in turn creates a thing that somehow we all share, and that we all have a duty to protect.

The late nineteenth- and early twentieth-century debate over corporate intellectual property rights seemed to have been settled by 1930 in favor of broad corporate rights. But the debate never really ended. Once intellectual property rights were cut loose from individual effort and creativity, their moral claims as property lost some of their force. An investment theory of intellectual property never had the same emotional resonance as a labor theory. When technological developments made it easier than ever before to copy copyrighted or patented materials and for employees with little job security to take customer lists, software, and other valuable know-how with them to new jobs, companies had no convincing argument as to why their investment entitles them to broad intellectual property rights. So when public opinion must be marshaled, they go back to the same images of the working man and the creative genius that have been floating around for two centuries or more.

The regime of corporate intellectual property that was established by 1930 remained stable throughout most of the twentieth century. Some economic sectors, notably Hollywood, adapted to a regime of corporate ownership of intellectual property by devising non-property regimes like screen credit to acknowledge and reward employee innovation. Virtually every business attributes credit in collaborative projects to identify, motivate, and reward productive, creative, and diligent employees. Credit for good work is valued for its own sake, but also as a marker of the existence of human capital among a highly mobile workforce, and sometimes as a status symbol. Informal norms of attribution played some of the roles (rewarding good work, punishing

Conclusion
shoddy work, deterring shirking, and signaling the existence of human capital) that were previously played by legal rules that made employee intellectual property and workplace knowledge almost inalienable.  

But norms of attribution can never be a perfect substitute for ownership of the underlying intellectual property or workplace knowledge. That is, while it is valuable to be credited as the person who designed a particularly nifty invention, it is not enough if a broad law of trade secrets or an ironclad non-compete agreement prevents the employee from building on past work. Early in the twenty-first century, some believe that excessively broad intellectual property rights stifle innovation because, as illustrated by Silicon Valley, innovation is spurred by information spillovers linked to employee mobility. A certain segment of talented computer engineers in the 1970s and afterward desperately wanted to avoid being the company men in a corporate R & D facility and choose the risks, independence, and opportunity to make a name for themselves in the start-up culture of Silicon Valley. The middle-class R & D employee, born and bred in the early twentieth century by a regime of bureaucratic and restrictive employment practices and strong corporate intellectual property rights, now seems like a stock character from the past. He does not represent a segment of society in which the young generation of would-be entrepreneurs in Silicon Valley can see themselves. Legal rights to knowledge may be moving away from the nineteenth-century regime in which ownership of intellectual property was inextricably tied to the person who created it. It may also be moving away from the corporate intellectual property regime that developed at the turn of the twentieth century, in which both ownership of the intellectual property and credit for its creation were firmly located in the corporation. The new model is a fragmented regime in which the corporation owns the intellectual property but the creative employees may obtain other economically valuable ways to capitalize on their creativity. The divorce of intellectual property rights from credit for innovation can be seen as an effort to return to the entrepreneurial approach to knowledge that characterized nineteenth-century American law.

While the participants, terms, and results of employer-employee disputes over control, ownership, and attribution of innovation changed over the course of the nineteenth century and again over the course of the twentieth, the conflicts and accommodations of the past shed light on the nature of creative work of the present. The line between individual and collective contributions to the production of ideas cannot be drawn as a matter of logic or nature. It changes with changes in the nature of the human personality and the social setting of work. As people worked together to create ideas and 

Conclusion
things, they used and ignored legal rules and, in the process, created new law while creating new inventions, texts, and ways of working. Knowledge about how knowledge was produced in the past reminds us of the contingency of the particular mix of individual and corporate entrepreneurship that characterizes early twenty-first-century arrangements over the control and attribution of innovations and intellectual property. It may also remind us to think skeptically about reductionist just-so stories and econmic claims about the efficiency of the current regime of legal rules. Finally it asks us to think about how a more just regime may be brought into being—not only by judges and lawyers, but also by the daily activity of each of us as workers, creators, consumers, and citizens.

95. 165 U.S. 578 (1897).
98. 72 N.W. 140, 144 (Mich. 1897).
99. 165 N.Y.S. 367 (Sup. Ct. 1917).
103. 69 N.Y.S. 813 (Sup. Ct. 1901).

PART III


3. Arnold M. Paul, Conservative Crisis and the Rule of Law: Attitudes of Bar and Bench, 1887–1895 (Gloucester, Mass.: Peter Smith, 1976), 1–2, notes the anxiety of "small businessmen," "professional and white-collar people" that the "traditional fluidity of American society" and "individual opportunity" were fast disappearing in the face of corporate consolidation, the accumulation of great wealth among the few, and the growing disparity between rich and poor.


5. Charles W. McCurdy, "The Roots of 'Liberty of Contract' Reconsidered: Major Prem-

6. Little v. Gallus, 38 N.Y.S. 487, 489–90 (N.Y. App. Div. 1896). See also Empire Steam Laundry v. Lozier, 130 P. 1180, 1182 (Cal. 1913) (“equity always protects against the unwarranted disclosure and unconscribable use of trade secrets’’); Westervelt v. Nat’l Paper & Supply Co., 57 N.E. 552, 554 (Ind. 1900) (the employer’s “machine was a secret, and, under the facts alleged, even if no agreement was made, one would be implied, that [the employee] was not to disclose the secret of the construction of the machine”); Aronson v. Orlow, 116 N.E. 951, 952–53 (Mass. 1917) (equity requires implied contract); O. & W. Thum Co. v. Tloczynski, 72 N.W. 140, 144 (Mich. 1897); MacBeth-Evans Glass Co. v. Schnelbach, 86 A. 688, 693 (Pa. 1913) (implied duty not to disclose); Stevens & Co. v. Stiles, 71 A. 802, 806 (R.I. 1909) (not necessary that there be an express contract).


**CHAPTER 6**


Notes to Pages 175–79


19. National Wire Bound Box Co. v. Healy, 189 F. 49, 55, 56 (7th Cir. 1911).

20. Id. at 55.

21. 239 Mass. 158, 131 N.E. 307, 308 (1921). Courts still occasionally insisted upon the rights of the inventive employee as entrepreneur. For example, in a 1911 decision involving an improved light bulb invented by employees of General Electric’s research labs, although the opinion paid great attention to the size and sophistication of the GE lab, the judge nevertheless held that the former employee was entitled to the patent because GE’s chemists initially dismissed the employee’s idea as impractical and refused to apply for a patent on it. Laddoff v. Dempster, 36 App. D.C. 520, 531 (1911).

22. The contract between the parties and Peck’s affidavit describing their relationship are in the Supreme Court record of the case, Standard Parts Co. v. Peck, 264 U.S. 52 (1924), which is available on microfilm.


24. Motion by Plaintiff for Rehearing, January 4, 1921, Supreme Court Record at 20.


29. 264 U.S. at 60.

30. Answer, Record in Supreme Court at 6.

Notes to Pages 181–86
31. 264 U.S. at 60.
34. See David Lange, “At Play in the Fields of the Word: Copyright and the Construction of Authorship in the Post-Literate Millennium,” 55 Law & Contemporary Problems 139, 149 (1992) (“the requirements of human existence will not suffer the author to die”).
35. See Lon L. Fuller, Legal Fictions (Stanford, Calif.: Stanford University Press, 1967), 67–68.
36. Blumin, Emergence of the Middle Class.
37. 20 N.Y.S. 110 (Sup. Ct. 1892).
41. Brayer, George Eastman, 82, 89; Ackerman, George Eastman, 89–90.
42. Eastman Co. v. Reichenbach, 20 N.Y.S. at 112, 113.
43. Brayer George Eastman, 89–91, 188; Ackerman, George Eastman, 90–94 and n. 2 (quoting a 1909 letter from Eastman to Reichenbach declining to hire him).
44. Brayer, George Eastman, 103.
45. Id., 94.
46. Id., 45, 50–51; Ackerman, George Eastman, 69–72.
47. Ackerman, George Eastman, 73 (quoting a letter from George Eastman to J. B. Church in which Eastman said, “The truth is they beat us by superior generalship”); Brayer, George Eastman, 51–52.

Notes to Pages 186–92


53. Id. at 73–74; Jenkins, *Images and Enterprise*, 312.


56. Jenkins, *Images and Enterprise*, 186 (quoting Eastman to Senier, October 5, 1901, and Eastman to H. L. Quigley, October 20, 1905).


66. Id. at 417.


68. W. E. Lewis to T. W. Bacchus, October 15, 1904; Lewis to Bacchus, November 1, 1904, Acc 518, Box 1004, File 15; Minutes of Meeting no. 6 of Superintendents, April 6, 1905; Minutes of Meeting no. 11 of Superintendents, September 7, 1905. These and all other twentieth-century materials are from the DPA: Du Pont Records; Vice Presidential Files; Hamilton Barkdale Papers, Accession 518, Box 1004, File 15; or in Accession 1305, Boxes 679, 680, 772, or 773, or in Irene du Pont Papers, Accession 228, Series H, Box 40, Files F:-ID-42.

69. Ernest du Pont to H. M. Barkdale, June 18, 1913; Agreement of October 22, 1906, between Ernest du Pont and E. I. du Pont Company. Other copies of the contract

Notes to Pages 192–97
and correspondence relating to it include R. Mudge to E. Prindle, June 24, 1914, and Affidavit of Charles Reese, E. I. du Pont de Nemours Powder Co. v. Masland, Exhibits A & D; H. M. Barksdale to Ernest du Pont, June 19, 1913; Alexis I. du Pont to Ernest du Pont, June 20, 1913.


72. Kanigel, One Best Way, 298–301.

73. A. J. Moxham and J. A. Haskell to Executive Committee, February 9, 1911.

74. Id.; Chandler and Salsbury, Pierre S. du Pont, 129.

75. L. R. Beardslee, Secretary to Du Pont Executive Committee, to J. A. Haskell, A. J. Moxham, and H. M. Barksdale, April 14, 1911 (reporting on actions of Executive Committee of April 12, 1911).

76. Executive Committee Matters Awaiting Attention. The Executive Committee periodically sent Barksdale reminders that the Executive Committee awaited his report. L. R. Beardslee to H. M. Barksdale, February 16, 1912. L. R. Beardslee to H. M. Barksdale, June 12, 1912. An Extract from Minutes of Executive Committee, February 13, 1912, was received in Barksdale’s office on February 6, 1914. February 16, 1912. Chandler and Salsbury, Pierre S. du Pont, 308.

77. Chemical Dept. to I. du Pont, March 2, 1915, Chemical Dept. to I. du Pont, January 14, 1915. C. Reese to Legal Department, April 7, 1915.


80. H. M. Barksdale to Manufacturing and Sales Committee, July 17, 1912; L. R. Beardslee to C. L. Reese, July 31, 1912.


82. E. I. du Pont de Nemours Powder Co. v. Masland, 244 U.S. 100 (1917). The record of the litigation is available on Supreme Court Records microfilm, as well as in the Hagley Museum and Library in Wilmington, Delaware; citations here are to the archives at the Hagley.


84. Charles Reese to William Whitten.

Notes to Pages 198–202
87. 244 U.S. at 103.
90. Id. at 415-16.
92. Prindle, *Patents as a Factor in Manufacturing*.
93. Id.
94. R. Mudge to Edwin Prindle, June 22, 1914.
95. Ireneee du Pont Papers.
96. Irving Klein to Edwin Prindle; E. R. Hughes to Edwin Hammer.
97. J. Laffey to Prindle, Wright, & Small.
99. Nancy M. West, *Kodak and the Lens of Nostalgia* (Charlottesville: University Press of Virginia, 2000). A history of the Eastman Kodak company contains the following "publisher's note" that identifies the company's ambiguous position with regard to intellectual property rights:

"Before modern trademark laws developed, many companies, including the Eastman Kodak Company, used trademarks and names creatively but not necessarily wisely. At the time, usage such as 'Take a Kodak with you' or 'Kodak as you go' was permitted in advertisements and marketing releases. Some examples of this usage are mentioned in this book for historical reference only.

"As correct usage legally became clearer, the Eastman Kodak Company moved to protect its trademarks vigorously and without loss of rights. All Kodak trademarks are now managed with great care and guarded with the appropriate attention."

100. See, e.g., Westervelt v. National Paper & Supply Co., 57 N.E. 552, 553 (Ind. 1900) (issuing an injunction against defendant's use of plaintiff's trade secret paper-bag machine where defendant hired plaintiff's former employee to design a paper-bag folding machine similar to the one the employee had designed for the plaintiff); Pressed Steel Car Co. v. Standard Steel Car Co., 60 A. 4, 10 (Pa. 1904).
101. See, e.g., Hackett, 62 N.Y.S. at 1078; Witkop & Holmes Co. v. Boyce, 112 N.Y.S. 874, 878 (Sup. Ct. 1908).
102. See, e.g., Stone v. Goss, 55 A. 736, 737 (N.J. 1903) ("The secret consisted in a knowledge of the proper method of mixing the ingredients").

104. The Restatement (Second) of Agency § 396 (1958) articulated the memory rule for trade secret protection, with an ambiguous qualifier at the end. The agent cannot, after the termination of agency, use "trade secrets, written lists of names, or other similar confidential matters . . . The agent is entitled to use general information concerning the method of business of his principal and the names of the customers retained in his memory, if not acquired in violation of his duty as agent." Cases holding that employees should be free to use information committed to memory, so long as it was not copied and memorized surreptitiously, include Hamilton Manufacturing Co. v. Tubbs Manufacturing Co., 216 F. 401, 408 (C.C.W.D. Mich. 1908); Fulton Grand Laundry Co. v. Johnson, 117 A. 753 (Md. 1922); Grand Union Tea Co. v. Dodds, 128 N.W. 1090, 1091 (Mich. 1910); Boosing v. Dorman, 103 N.E. 1121 (N.Y. 1913); S. W. Scott & Co. v. Scott, 174 N.Y.S. 583, 586–87 (App. Div. 1919); Peerless Pattern Co. v. Pictorial Review Co., 132 N.Y.S. 37, 39 (App. Div. 1911); Stevens & Co. v. Stiles, 71 A. 802, 802 (R.I. 1909).


106. Recent examples of using findings of fact to make significant choices about the extent to which firms should be able to control employee mobility include Hoskins Manufacturing Co. v. PMC Corp., 47 F. Supp. 2d 852 (E.D. Mich. 1999) (cable manufacturer failed to prove that former employees who worked for competing firm would inevitably disclose or use trade secrets rather than general knowledge); Utah Medical Products, Inc. v. Clinical Innovations Associates, Inc., 79 F. Supp. 2d 1290 (D. Utah 1999) (medical device manufacturer failed to prove that former executives who started competing firm used trade secrets rather than general knowledge in designing and marketing a competing product); Microbiological Research Corporation v. Muna, 625 P.2d 690, 699 (Utah 1981).

CHAPTER 7


4. Even today there are differences in copyright protection depending on whether the author is an individual or a corporation; for example, when the "author" is a corporation, the term of copyright is different than when the author is a natural person.

Notes to Pages 208–14
8. The court cited Atwill v. Ferrett (1846), discussed above in chapter 2, Colliery Engineer Co. v. United Correspondence Schools (1899), discussed below, and Schumacher v. Schwencke.
16. Andrew Goodman, Gilbert and Sullivan at Law (Rutherford, N.J.: Fairleigh Dickinson University Press, 1983), 175. The history of the Burrow-Giles case, Sarony, the relationship between Sarony and Wilde, and the social context that led to the litigation over the photograph will be told by Mark Rose in his forthcoming book, Authors in Court: Scenes in the History of Literary Property. I am grateful to him for sharing a draft of his chapter and some of his thoughts with me.
20. Sarony, 111 U.S. at 60.
21. The record of Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53 (1884), in the Supreme Court is available on microfilm. The complaint and trial court findings are in the record at pp. 4 and 14.
25. Id. at 60.
26. Id. at 61 (quoting 11 Q.B. Div. 627 [1883] [Brett, M.R.]).
27. Id. at 60.
29. 94 F. 152, 153 (C.C.S.D.N.Y. 1899).
30. 73 F. 196, 198—99 (2d Cir. 1896).
31. 128 U.S. 617 (1888).
32. Freeman to Myers, February 15, 1877 (reprinted in Supreme Court Record of Callaghan v. Myers at 366).
34. 128 U.S. at 647, 650 (emphasis added).
35. The implied contract concept was used in patent cases of this era as well. See Salomon v. Hertz, 2 A. 379 (N.J. 1890).
38. At that time, the distinction between servants and contractors functioned to determine the liability of the employer to third parties for torts committed by the servant or contractor. See Horace Gay Wood, A Treatise on the Law of Master and Servant, 601 (1877) (defining a servant as “a person who, by contract or operation of law, is for a limited period subject to the authority or control of another person in a particular trade, business or occupation,” and explaining that an employer is not liable for the acts of contractors “except when he retains control over the manner or instrumentalities of the work”). Mechem’s treatise on the law of agency confessed that “[t]he line of demarcation between the relation of principal and agent, and that of master and servant is exceedingly difficult to define. This difficulty arises largely from the fact that the two relations are essentially similar. Indeed, there is much reason for saying that the difference between them is one of degree only, and not of kind.” Floyd R. Mechem, A Treatise on the Law of Agency (Chicago: Callaghan, 1889), 2. Mechem ultimately concluded that agency properly relates to transactions of business with third persons, and implies more or less of discretion in the agent as to the time and manner of his performance. Service, on the other hand, has reference to actions upon or about things. It deals chiefly with matters of mere manual or mechanical execution, in which the servant acts under the direction and control of the master. Id., 3. The distinction between “things” and “business” obviously no longer holds, although the different degrees of supervision are today the essential distinction between employees and independent contractors. But Mechem went on to note all the exceptions to the notion of supervision as being determinative, and added that the agent typically works by the project rather than for a fixed period. He then cautioned, however, that an agent’s period of employment might be fixed. Id., 4. See generally William Evans, A Treatise upon the Law of Principal and Agent in Contract and Tort (Chicago: Chicago Legal News, 1879) (containing a chapter on the liability of employers for injuries caused by the negligence of fellow servants but little discussion otherwise of employment, and no discussion of the distinction between agents and servants); Francis Wharton, A Commentary on the Law of Agency and Agents (Philadelphia: Kay & Bro., 1876), §§321, 227 (explaining that an agent is paid by commission, whereas a servant is paid by wages).

Notes to Pages 220—24

41. Id., 56.
42. Id.
43. 2 id., xxiv.
44. Id., 65.
45. Id., 143–44.
46. Id., 188.
47. 3 id., xxx.
48. 4 id. at pt. J.
49. Except as otherwise noted, all the history on the Rand McNally Company and citations to archival materials are to the Rand McNally Company Records, John M. Wing Foundation on the History of Printing, Newberry Library, Chicago.
50. Series 3, Box 8, Folder 89, RMR.
51. Series 3, Box 13, Folder 193, RMR.
52. Series 3, Box 8, Folder 89, RMR. This is drawn from an unpublished history of the company written by Bruce Grant and draws on a short history of the company prepared by James McNally.
54. Bruce Grant, unpublished manuscript on the history of the company, quoting Inland Printer, February 1894, 410–11, Series 1, Box 6, Folder 160, RMR.
56. L. M. Hopkins, Attorney at Law, to Rand McNally, January 4, 18, 1906, Series 2, Box 1, Folder 6 (transmitting patent and patent assignments); copyright registrations received by Rand McNally from the Register of Copyrights at the Library of Congress for various maps and books in the 1890s and 1900s, Series 2, Box 7, Folder 124; both in RMR.
57. Series 3, Box 3, Folder 5, RMR.
58. Series 3, Box 7, Folder 75, RMR.
59. Series 3, Box 7, Folder 69, RMR.
60. Folio Rand McNally Atlas, G6, 1932 (see p. xvi for the preface and pp. 4–5 for the Rand McNally copyright claim on the map for which the University of Chicago owned the projection).
61. On Goode’s homolosine equal-area projection and the challenge and controversy associated with different methods of portraying the relative size of continents on a flat

Notes to Pages 224–32

62. Series 3, Box 6, Folder 47, RMR.
63. Series 2, Box 7, Folder 113, RMR.
64. Helmut Bay, “My Thirty-Eight Years with Rand McNally & Co.,” pamphlet (Washington, D.C., 1964), Series 2, Box 14, Folder 211, RMR.
65. Id.
66. Helmut Bay, “The Beginning of Modern Road Maps in the United States,” paper, Series 2, Box 14, Folder 211, RMR.
67. For example, William E. Johnson, who was chief cartographer at the firm in the 1920s and 1930s, assigned several patents to his inventions to the firm and was rarely credited for his work. One example of a Rand-McNally book that credited no author was an 1897 atlas, *The World’s Peoples and the Countries They Live In*, Series 3, Box 17, Folder 252, RMR.
69. 188 U.S. 239 (1903).
70. Testimony of George Beinstein, Supreme Court Record of Beinstein v. Donaldson Lithographing Co. at 34–35.
71. 188 U.S. at 249.
72. Id. at 248.
73. Another court did not bother to justify it, simply relying on Schumacher as controlling authority. See Mutual Advertising Co. v. Refo, 76 F. 961, 963 (C.C.D.S.C. 1896).
74. 188 U.S. at 249–50.
75. 188 U.S. at 252 (Harlan, J., dissenting).
76. Id., 251–52.
78. Id.

CONCLUSION


Notes to Pages 233–42
10. Bourdieu said that a class exists "when there are agents capable of imposing themselves, as authorized to speak . . . upon those who, by recognizing them as endowed with full power to speak and act in their name, recognize themselves as members of the class, and in doing so, confer upon it the only form of existence a group can possess." Pierre Bourdieu, "What Makes a Class? On the Theoretical and Practical Existence of Groups," Berkeley Journal of Sociology 1, 15 (1987).
14. Id. On engineers and the transformation of the middle class in the twentieth century, see Robert Zussman, Mechanics of the Middle Class: Work and Politics among American Engineers (Berkeley: University of California Press, 1985), chaps. 1, 11.
16. The vast expansion of relatively low-paid nonmanual office work without opportunity for upward mobility was one of the most significant social and economic changes in the emergence of the modern middle class: it weakened the distinction between manual

Notes to Pages 242–46
and nonmanual work as it also eliminated office work as a form of business apprenticeship leading to eventual independence. See Stuart M. Blumin, The Emergence of the Middle Class: Social Experience in the American City, 1760–1900 (New York: Cambridge University Press, 1986), 290–91.

17. The expert on railroad innovation on whose work I have relied extremely heavily is Steven W. Usselman. See Usselman, “Patents, Engineering Professionals, and Pipelines of Innovation,” chapter 2 in Learning by Doing in Markets, Firms, and Countries, edited by Naomi R. Lamoreaux, Daniel M. Raff, and Peter Temin (Chicago: University of Chicago Press, 1998); and Usselman, Regulating Railroad Innovation.

18. Naomi R. Lamoreaux and Kenneth L. Sokoloff, “Inventors, Firms, and the Market for Technology in the Late Nineteenth and Early Twentieth Centuries,” in Learning by Doing in Markets, Firms, and Countries, 48 and n. 47. The quotation of the Pullman Company document is “Policy and Procedure in Patent Matters.” November 21, 1913, Secretary and Treasurer, Office of the Secretary and Treasurer, Box 1, Folder 2, Pullman Company Archives.

19. Christopher P. Wilson, White Collar Fictions: Class and Social Representation in American Literature, 1885–1925 (Athens: University of Georgia Press, 1992), 29 (discussing the portrayal of white-collar employees in the work of O. Henry: “[T]he problem of white collar dependence was more subtle, and the alterations in middle-class ideologies less cataclysmic than may be supposed. For ‘dependence’ could mean not simply a loss of entrepreneurial energy or a putative freedom to act, but something that went to the core of cultural justifications for character, loyalty, even self-hood itself. It could mean disappearing into a corporation’s identity at the expense of one’s own; it could mean a threat to the borders between what was legitimately inside work and outside of it; it could signify identification with the corporation, loyalty to the commodity, at the expense of other loyalties to family or community”).


23. Id., 753.


26. Id., 120. E. B. Craft of Bell Labs described the corporate control over all phases of the patent process as follows: all of the research leading up to a possible patent “is very carefully recorded in our laboratory notebooks, a complete record of all the work that is done, and these are turned over to the patent organization and they determine who the inventors are” (quoting E. B. Craft, Bell Educational Conference, 1925 47 [New York: Bell System, 1925]).


Notes to Pages 247–52


