

Frederick W. Taylor and Industrial Espionage: 1895-1897

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It is unusual that for a business historian to discover correspondence revealing the activities of individuals conducting industrial espionage. Fortunately, such letters do exist and the story of what they reveal is the subject of our present analysis.

The existing biographies of Frederick W. Taylor, the "Father of Scientific Management" by Frank B. Copley [1], Sudhir Kakar [2] and Daniel Nelson [3] have large gaps and fail to provide us with a complete account of Taylor's life. Despite this fact, the majority of management scholars accept the biographies as accurate and complete. The existence of these gaps in the accounts of Taylor's life since 1920, is due to the fact that the committee in charge of preparing the original biography in 1920, elected to delete portions of Taylor's life which did not please Mrs. Taylor and which, in the committee's opinion, should remain unknown to the world [22].

Careful examination of the Taylor papers still existing in the Taylor Collection at Stevens Institute of Technology, however, reveals a Taylor generally unknown to management scholars. In this paper, through the use of unpublished documents, we discuss a facet of Taylor's life previously neglected by management scholars: his utilization of industrial espionage. Taylor engaged in this activity during the period 1895-1897 to meet the pressing problems faced by one of his clients, the Simonds Rolling Machine Company (SRM). To understand Taylor's use of industrial spies we first examine his relationship with Simonds, followed by an account of his espionage activities.

BACKGROUND

Copley's account of Taylor's work at Simonds is very brief, but even this scanty material was originally discouraged by the members of the committee on the Taylor biography, which was selected by Mrs. Taylor to review Copley's original manuscript. In 1920, Harlow Person prepared a "Final Memorandum on Manuscript of Copley's 'Taylor'" stating:

Taylor lived his life, so far as posterity is concerned,--made his great contribution to society--chiefly in the period 1878-1889 . . . the decade 1889-1900 is given enough space, but . . . there is too much about the Maine, Wisconsin and Fitchburg life--which is relatively unimportant....[22, p.2. Emphasis is in original]

In his "notes on the biography," Sanford Thompson stated there was "too much detail on the Manufacturing Investment Company. Data on Symonds (sic) should be condensed" [23, p. 3].

TAYLOR'S RELATIONSHIP WITH THE SIMONDS ROLLING MACHINE COMPANY 1889-1892

In the 1880s, George F. Simonds of Fitchburg, Massachusetts, observed that circular objects could be formed into any shape by rotating them on their axes between opposite moving surfaces, and in 1884 he secured patents on his rolling machine. Simonds, at the time, was president of the Simonds Manufacturing Company of Fitchburg, which produced saws and superior cutting tools of every description. He resigned, and in 1886 the Simonds Rolling Machine Company was incorporated. In his biography of Taylor, Nelson claimed that the company acquired the rights to Taylor's forging patent in 1888, and "Taylor took stock in the company rather than cash for his invention" [3, p. 55]. Nelson cites Copley as his source of information, but while Copley states that SRM acquired Taylor's rights to "rolling machinery on which Taylor held patents" and that his information was that "Taylor received stock in the company" for these rights, there is no evidence to support Copley's assertions [1, I, p. 392]. Taylor never "took stock" for his inventions. Taylor's acquisition of SRM stock was obtained through an agreement with Chauncey Smith, Secretary of SRM, to have the right to sell shares of the capital stock of SRM. The directors authorized this agreement on October 21, 1889, stating that SRM "will pay him as a commission on such sales \$13 per share" [19, 1889]. By April 25, 1890, Taylor had sold 486 shares at \$102 per share and 456 shares at \$115, earning \$3,313 [17, April 25, 1890]. Taylor and his wife only had 100 shares of stock in the company, but for reasons we now discuss, he played an important role in the Simonds Company affairs.

While Taylor did not sell his forging patents to SRM in exchange for stock, his importance in the firm resulted from the fact that his initial con-

tact with SRM came through John Grant, the superintendent of SRM who was interested in manufacturing armor-piercing projectiles at Fitchburg. Grant contacted Taylor on this problem because, as Taylor testified in the patent suits in 1897, when asked if he had any "familiarity with the art pertaining to guns of different kinds, and projectiles used therefore," he replied, "I am familiar with the manufacture of all forgings used in producing modern cannon" [5, pp. 419-20]. Under the agreement reached by Taylor with SRM, the steel was manufactured by Midvale and the forms for the projectiles by SRM. Work began in December 1889, as shown in the letter of December 16, 1889. The work progressed through 1890, but by May, 1891, Sawyer informed Taylor that it was still slow in developing and SRM was waiting for army test results. By 1892, SRM was only manufacturing the shell forgings with Driggs doing the rest of the work. On July 16, 1892, Sawyer happily informed Taylor that all of the 500 SRM shells tested by the army "broke up splendidly into some 30 killing pieces" [17, July 16, 1892]. With this information Taylor suggested to Sawyer that SRM should now raise the prices of projectile forgings for Driggs to their highest level [Taylor to Sawyer, July 20, 1892]. Whether this suggestion led to the eventual termination of the arrangement with Driggs is not known at present, but the topic of making projectiles disappears from Taylor's SRM correspondence. Nevertheless, projectiles were used as a feature of SRM advertisements for many years.

By August 1890, Taylor began to assume even more importance to SRM, at least in the eyes of president George F. Simonds. He liked Taylor because he had invested in SRM (not because Simonds had purchased Taylor's forging patent):

I have learned through Mr. Grant that you are not only interested in "The Metal Rolling Machine" financially yourself, but have also placed considerable stock with others and am therefore doubly interested in the quick and full success of the enterprise [19, August 16, 1890].

Four days later, Simonds wrote Taylor again about conditions at SRM:

Things are not going well either in the shop or out of it . . . changes should be made to put the business in shape for making money and for this reason I wish to meet with you in private at as early a day as possible. [19, August 20, 1890].

Taylor did not reply to this letter until September 2, 1890, because he was on vacation and just starting his job with the Manufacturing Investment Company (MIC). In his reply Taylor said he was too busy to meet with Simonds. From September to December, 1890, several attempts were made to hold a meeting between Taylor and Simonds as well as with the board of directors, but problems with MIC prevented Taylor from doing so.

In the fall of 1893, Taylor began very close work with Simonds, originally redesigning the accounting side of the business, but quickly branching out to other aspects. From September 1894, to May 1895, Taylor worked for William Cramp and Sons Shipyard in Philadelphia, but there is no detailed information on his work there. While Taylor was at Cramp, George F. Simonds fell off a train in Scranton, Kansas, on November 5, 1894, and was killed [4]. The death of Simonds made Taylor an important figure at SRM for two major reasons. First, he was the only engineer in SRM with experience in heavy machinery who could possibly improve Simonds' rolling machines and who probably would not sell out to SRM rivals, and second, he was perhaps the best person to conduct experiments and investigations to ward off the threat of infringement by rival firms. More important, Taylor had plans for a steel ball combination which he expressed to George Weymouth in April 1895 [11]. An association (The American Ball Association) was already being formed and Alfred Bowditch of SRM, apparently asked Taylor to help by investigating the companies involved. This was his first task when he returned to Boston.

TAYLOR'S FIRST ADVENTURE INTO INDUSTRIAL ESPIONAGE: THE WORK OF NEWCOMB CARLTON

Nelson states that Taylor moved to Boston in March 1895, but "Why they went to Boston is unclear. Taylor may have gone back to Simonds . . ." [3, p. 58]. The correspondence, however, reveals that the reasons are not "unclear." In June 1895, in order to help SRM in their decision as to whether to join The American Ball Association, Taylor arranged to have Newcomb Carlton obtain information on SRM's rivals. Carlton, an 1890 graduate of Steven Institute of Technology and a practicing mechanical engineer in Buffalo, New York, had contacted Taylor in 1894 about obtaining Taylor's recommendation for Carlton's membership in the American Society for Mechanical Engineers (ASME). Taylor now told Carlton that he would support his application if Carlton could help him investigate the members of the proposed association. Carlton agreed to aid Taylor.

Under Taylor's plan, Carlton would pose as the representative of a group of capitalists who wanted to form a company to manufacture bicycle ball bearings in order to capitalize on the existing bicycle craze. Carlton would play the role of an engineer hired to examine and purchase the rolling machines required, or to advise the mythical capitalists as to the advisability of purchasing an existing company.

As originally planned, Carlton would visit three companies: the Roughead and Jones Company of Tonawanda, New York (also known as the Excelsior Ball Company); the Hathorn Fancy Forging Company of Bangor, Maine; and

the Cleveland Machine Screw Company (CMS). However, because Carlton was unsuccessful in gaining admittance into the Roughhead and Jones plant and Cleveland Machine Screw Company, Taylor hired another agent to infiltrate these two plants.

At the Hathorn Company, Carlton met George Hathorn the inventor of the Hathorn Rolling Machine and Hathorn Ball Gauging Machine. He so convinced Hathorn that the nonexistent capitalists would purchase his company, that Hathorn offered to move the plant to Buffalo. George Hathorn was so impressed with Carlton that he wrote him a confidential letter on October 11, 1895. In the letter he informed Carlton that although he had taken Mr. George Wheelright into the Hathorn Company to "furnish the money to go into the ball business, he has not enough to put it in the front rank." However, he said his process of manufacturing balls was so different that he could produce them for less than one-half of the cost of Simonds. Further, he told Carlton that although the Hathorn Company was considering merging with the Stanley Tool Company, he would like to put the machines of the company where he could get the most benefit. Hathorn concluded that if he could have "the capital guaranteed I would be willing to ship to a county what I have for inventories. If we put it into another co. it should be done at once as if we stay here we shal (sic) have to put in a larger engine and boiler and should not want to move after we had done that." [20].

Carlton also secured samples of the Hathorn metal balls as they came from the rolling machines and after an analysis of these concluded that Hathorn was not infringing on the SRM patents and so informed Taylor. Once he was convinced that Carlton was correct, Taylor told him to drop negotiations with Hathorn. Carlton subsequently informed George Hathorn that the nonexistent capitalists had decided not to purchase his company and because of his expectations (as shown in his letter of October 11th) Hathorn was enraged, as Carlton wrote Taylor:

It looks to me as if the Hathorn Co., were rather anxious to put the deal through. Mr. Hathorn has written me one or two savage letters, but I find that the lying I have done lately has hardened me beyond any ordinary form of reproach [13].

Since Carlton had performed his task so well, Taylor approved his application to the ASME. Carlton eventually became president of Western Union Company and his role as one of Taylor's espionage agents was forgotten in management history.

H. S. SHADBOLT, PHASE I: INVESTIGATING THE ROUGHEAD AND JONES COMPANY AND THE CLEVELAND MACHINE SCREW COMPANY, 1895.

Concurrent with the employment of Carlton, Taylor also hired H. S. Shadbolt of Chicago, a detective in mechanical and patent matters. Because Carlton had failed to gain entrance into the Roughead and Jones plant in Tonawanda, New York, Taylor first asked Shadbolt to obtain a job there and to then study their rolling machines and the steel balls produced by these machines. Shadbolt traveled to Tonawanda and after some difficulty located the company, but he was unable to obtain a job. Shadbolt rented a room in a hotel near the local saloon frequented by Roughead and Jones employees and soon obtained a job as a general mechanic in the company. Shadbolt apparently was inept as a mechanic since he informed Taylor that he had smashed his foot by dropping a forging on it and broke his finger in a vise. However, he soon was able to report to Taylor that the company was not infringing on the SRM patents [18, September 22, 1895]. Because Shadbolt was successful, Taylor told him to use his broken finger as an excuse for resigning from Roughead and Jones, and that his next task was to investigate whether the Cleveland Machine Screw Company was adopting any SRM machinery or methods.

Because John Grant, past SRM employee, was one of the owners of CMS and possibly knew Shadbolt from previous jobs he had performed for Taylor, Shadbolt was not asked to work inside CMS. Instead Taylor conceived of a new approach. In October he told Shadbolt to go to Cleveland and place an advertisement in the Cleveland newspaper for rolling machine mechanics to work in a company being formed to manufacture bicycle balls -- the mechanics were instructed to write to a box number. He also told Shadbolt to interview these mechanics and if they were from CMS, attempt to discover if CMS was employing any machines similar to those at SRM. Shadbolt rented a room at the Forrest City House, and after interviewing a number of CMS mechanics he wrote Taylor saying, "Your scheme of advertising worked fine, as all your schemes do . . . Now, Mr. Taylor, I am now thoroughly convinced (after interviewing mechanics) that they are not using your process for making balls" [18, November 13, 1895].

Now assured that CMS was not using any of the SRM process (even though Grant had previously worked for SRM), Taylor told Shadbolt to conclude his investigation.

A NEW INVESTIGATOR FOR TAYLOR: E. A. KENDALL, 1895-1896

In November 1895, Taylor himself was faced with a new problem that brought him, temporarily, in contact with his former Manufacturing Investment Company employee, William C. Whitney. He discovered that the Pope Manufacturing Company of Hartford, Connecticut, a manufacturer of bicycles, was infringing on the SRM patents. The Pope Company was actually owned by the Electric Vehicle Company of New York, which, in turn, was owned by William C. Whitney. Because he knew Whitney, Taylor decided to proceed carefully and through Shadbolt he contacted Ernest A. Kendall, a Pope employee, who agreed to act as an investigator. In a short time Kendall provided Taylor with proof that Pope was using a rolling machine constructed like those at SRM. Kendall subsequently made an affidavit that Pope had been infringing on the Simonds patents since 1890 [21]. The original affidavit was prepared by Taylor, a method he repeated in 1896. The Pope Company eventually arrived at a settlement with SRM, paying a royalty to continue using the Simonds type rolling machine.

In July 1896, another problem arose concerning SRM. On July 31, 1896, Alfred Bowditch of SRM wrote Taylor that the Overman Wheel Company of Chicopee Falls, New Hampshire, was using the Simonds rolling process and asked him if Shadbolt could investigate [12, July 31, 1896]. Taylor replied on August 3 saying he was already aware of this problem and since Shadbolt was engaged on another job he had hired Kendall to investigate the problem. Kendall had been unable to get a job in the company, but had been able to obtain samples of the rough forgings manufactured by Overman. "He did not get into the Overman Works, but obtained the forgings through some of Overman's men. These forgings show conclusively from their appearance that they were not made by our process," Taylor wrote to Bowditch [6, August 3, 1896].

INVESTIGATING HATHORN: A. B. PURINGTON, 1896-1897

In 1896, Taylor completed a contract with the Johnson Company of Johnstown, Pennsylvania, to improve their bookkeeping system. As usual, he initially began his work by adopting the bookkeeping methods of SRM. In working at Johnson, Taylor was faced with many problems simply because more difficulties had arisen in connection with the SRM patents. In February 1896, Bowditch informed Taylor he had received a letter from A. B. Purington of Keuduskeag, Maine, who wrote SRM stating that the Hathorn Company was not only infringing on the Simonds patents, but that he had helped to develop their first ball grinding machine, which was based on the Simonds patents. In his letter, Bowditch said he was sending Taylor the drawings Purington had

sent to SRM and asked Taylor to study them and then contact Purington [12, February 25, 1896].

In March, Taylor wrote Purington to come to Johnstown to make detailed drawings of the Hathorn machines and sent him the funds to make the trip. Purington arrived on March 14, 1896, and at the same time Bowditch asked Taylor to obtain the affidavit as soon as possible. Taylor replied that he first wanted to know Purington, "size him up, so as to know how to get at him" [6, March 17, 1896]. Taylor himself prepared the sketches and affidavit to expedite the information to Bowditch. Taylor also told Bowditch (although Bowditch in his letter of February 25 had suggested Purington might be a spy for Hathorn), Purington might prove useful to SRM and that Bowditch should hire him. Taylor wrote, "Purington, I think, will prove a valuable man for us. He offers to make us a complete rolling machine for I think \$300.00 to 400.00 exactly like the Hathorn machine, . . . He says the pattern for this machine belongs to one of the machine shops in Bangor. I have also made accurate sketches of the Hathorn ball gauging machine which seems to me far superior to ours" [6, March 24, 1896].

Taylor also told Bowditch that he had difficulty in getting Purington to sign the affidavit, but he took him to a lawyer where "his cupidity finally got the better of his other scruples and he made a very full and satisfactory affidavit" [6, March 24, 1896].

In 1897, Taylor once again asked Purington to investigate Hathorn. Purington began by talking with friends who worked for Hathorn and he discovered that the Hathorn Company was using rolling machines like SRM and, in addition, a new type of grinder to finish the balls. At the same time, the Hathorn Company was reorganized and the name changed from the Hathorn Fancy Forging Company to the Hathorn Manufacturing Company. In March, the Simonds Company initiated a suit against Hathorn. At this time Taylor decided that more information was required about Hathorn's activities and asked Purington to investigate. Purington wrote Taylor on March 26, 1897, that the company was manufacturing one million balls a week on nine forging machines. In addition, Purington informed Taylor that since the reorganization of Hathorn, George Hathorn had become dissatisfied with the president of the company. Purington's information confirmed what Carlton had discovered in 1895, when he was contacted by George Hathorn.

Because of Purington's information, Taylor contacted Hathorn. He discovered that Hathorn was willing to testify in the case that none of the Hathorn people had ever seen balls made by a Bundy die. Taylor considered this important for the trial and in talking with Hathorn, discovered he was willing to sell the rights to his "Lightening Grinder" [14]. Taylor used Purington to check on this grinder and on June 1, 1897, he sent details to Taylor on

this machine [16]. Taylor made efforts to purchase this machine for SRM, but was not successful.

H. S. SHADBOLT, PHASE II: THE OVERMAN WHEEL INVESTIGATION, 1897

In May 1897, SRM suspected that the Overman Wheel Company was infringing on the Simonds patents. Once again Taylor hired Shadbolt to investigate. Shadbolt went to Chicopee Falls but at first was unable to secure employment. Shadbolt again rented a room near a saloon; and although he got drunk with the Overman mechanics, he unfortunately was unable to obtain a job in the plant [18, May 29, 1897]. Meanwhile, Taylor, still eager to obtain inside information on Overman, had already suggested that Shadbolt could gain entrance into the factory by getting "acquainted with the foreman ... or ... (by) straying into the department..." [10]. Shadbolt finally decided to take Taylor's advice and eventually was able to secure admission into the plant and without permission walked into the department where the rolling machines were located. Here, before he was discovered by the foreman and ordered to leave, he saw dies being used that were similar to those used by SRM. Although Shadbolt forwarded this information to Taylor, it was never used because the Overman Company failed in December 1897.

The variety of patent problems faced by SRM and the decline of the bicycle fad led Taylor, in November 1897, to begin negotiations to install piecework at the Bethlehem Iron Company. As a result, the investigations of Taylor's various operatives were terminated and no further letters on his industrial espionage activities can be found. The use of these individuals also proved unnecessary by SRM because on June 8, 1898, the SRM directors "... voted to discontinue manufacturing" [15].

Eleven months after SRM discontinued operations, the court suit of the SRM against Hathorn was decided in favor of SRM. At this time, Taylor wrote to the lawyer for SRM, W. K. Richardson concerning the results of the suit and the work of his operatives, "While I doubt whether the Simonds Company is in a position to profit much, if any, by the result of the suit, still it is a great satisfaction to feel that our work, which extended over some year and a half ... [1895-96] was not all thrown away" [8].

In this manner Taylor for the last time referred to the investigations of his four detectives.

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13. Correspondence to Taylor from Newcomb Carlton, November 22, 1895, File 41 FWT Collection.

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