The Woman and the Typewriter: A Case Study in Technological Innovation and Social Change

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Daniel J. Boorstin [3, p. 399] has written that

> the typewriter was destined... to become an important force in American life. By providing a socially acceptable employment for women in the commercial world, it opened new office careers, and (with the telephone) helped bring women out of the kitchen into the world of affairs.[1]

He is perhaps the most prestigious historian to repeat one of the most popular stories in American technological history.[2] The invention of the typewriter got women out of the house. The big question here is the relationship between technological change (invention and innovation) and social change (alterations in the working, living, and playing habits of society). Two phenomena are clearly visible: the invention and rapid spread of the typewriter, and the equally rapid spread of the female secretary. This paper begins to explore the relationship between those two phenomena. Were they indeed so closely and simply related as many historians have assumed? Was it really the influence of the typewriter alone that changed the sex composition of the American business office? Why did women enter the office? Was the typewriter's invention crucial or merely coincidental?

First, I shall very briefly outline the typewriter's invention and commercial appearance. Before 1867, there were a number of efforts to produce a mechanical writing machine, probably some 30 serious attempts including Burt's typographer of 1829, the Thurber machine of 1843, and the Jones's Mechanical Typographer of 1852.[3] None was commercially successful. In 1867 Christopher Lathan Sholes, a Milwaukee printer, politician, and sometimes inventor, began work on a machine later called the "type-writer." Urged on by the promoter, James Densmore, Sholes continued to improve the machine between 1867 and 1873 with the help of Carlos Glidden, a lawyer, Samuel W. Soule, a civil engineer and draftsman, and Matthias Schwalbach, a machinist, inventor, and tower clockmaker. On 1 March 1873, the firm of E. Remington & Sons, makers of firearms, sewing machines, and farm equipment, agreed to manufacture

the machine. Two previous efforts by Densmore, the first in Chicago and the second in Milwaukee, had failed. William K. Jenne, chief mechanic in the Remington Sewing Machine Department and Jefferson M. Clough, the Remington superintendent of mechanics, redesigned and adapted the Sholes model to mass production techniques. On 30 April 1874, the first "Sholes & Glidden" machine arrived in Milwaukee, and two months later, on 1 July 1874, the typewriter went on sale to the public. It was a "blind writer" (meaning the operative could not see what was being typed) and wrote capitals only. It was mounted on a sewing machine base and used a foot treadle to return the carriage. Both these aspects show the influence of Jenne, the sewing machine mechanic. This first machine went through several revisions until 1878 when the Remington #2 was introduced. This greatly improved machine wrote both capitals and lower-case letters, had a hand-returned carriage (as had later Sholes & Glidden models), and was designed for table-top use. Although the sewing machine base had been abandoned, the Remington #2 was still a blind writer [4].[4]

Typewriter sales were initially slow but increased rapidly in the 1880s, particularly after 1882, when competing machines began to crowd the Remington market, notably the Caligraph, the Crandall, the Hammond, and the Hall [4, Ch. 10]. In 1881 Remington sold 1,200 machines, the following year 1,400, and in 1887, 14,000 [9].[5] The mid-1880s marks the commercial acceptance of the typewriter, some 10 years after its manufacture began. By 1900, Remington alone had sold more than one-half million machines [6].[6]

Second, a few statistics about the influx of women into the office. There is no doubt that when its use became widespread, the typewriter was operated primarily by women. In 1870, while the typewriter was still a model in the Kleinsteuber Machine Shop, there were seven women stenographers, by 1900 there were 200,000, and by 1930, there were 2,000,000. To further emphasize this transition, in 1870 those 7 women were 4.5 percent of the 154 "stenographers" in the US. In 1880, there were an estimated 2,000 women out of a total of 5,000 such employees, 40 percent female. In 1889, 63.8 percent of the 33,418 clerical workers classified as "stenographers and typists" were women, and an observer at the time could note that nine out of ten clerical jobs went to women. By 1900, the proportion of women was 76.7 percent [6, p. 9]. As Margery Davies notes, "The feminization of low-level clerical work proceeded extremely rapidly" [6, p. 9].

At this early stage of investigation, the tentative interpretation offered here suggests that the appearance of the female secretary was certainly hastened by the invention of the typewriter. However, the typewriter was only one of a number of economic and noneconomic forces at work. Its invention was, nevertheless, the key event, the catalyst which sparked this rapid social change. Had the typewriter come on the scene in the absence of these forces, it would probably have gone largely unnoticed.

For analytical purposes, the problem can be cast as a supply and demand equation. The demand for typists was influenced by such factors as (1) the growth in the size and complexity of American firms and the resulting expansion of office staffs, (2) the benefits of adopting the typewriter, and (3) the relatively low wage rates for women compared with men. Supply side considerations include (1) the relatively high wages for women compared with their alternatives, (2) the role of typing schools and the YWCA, (3) the status and respectability of office employment, (4) the education of women, (5) the sex neutrality of typing, (6) the feminist arguments, and (7) the iconography of the typewriter. Therefore, included in both supply and demand factors are noneconomic as well as economic forces, particularly on the supply side. These elements do not lend themselves easily to an assessment of their relative influence. Obviously, the demand for typists is a function of the supply of typewriters, but the industry seems to have been able to supply the demands of business with little trouble. The lack of typewriters was not a factor.[7]

The commercial success of the typewriter occurred because it was accepted by business. It was particularly well suited for the new demands of business. Post-Civil War changes in corporate structure brought strong demands first for a vast increase in the information collected at the lower levels of a firm and passed on to higher levels for evaluation and use in decision-making. Second, the very quantity of business a company conducted, as well as its size, increased as many firms expanded to capture national and international markets.[8] In essence, the amount of paperwork and the demand for clerical help in the business community increased radically, and the expanding office staff had only traditional tools with which to handle the oncoming avalanche of paper. Those tools were the steel pen, paper, and the ledger book.

The typewriter not only met many of the new needs of the changing office but also eliminated potential problems. It was, when operated by a trained typist, much faster (and hence cheaper) than writing by hand. One writer claimed in 1888 that it saved "40 minutes an hour" or "5 hours and 20 minutes in a business day" [9, p. 28]. In contests between speed writers and speed typists, the typists invariably won by 30 words per minute and more. The best hand writer could write about 65 words per minute while the best typist could often type 90 to 100 words per minute (9, p. 30]. The averages, of course, were well below this.

The introduction of carbon paper about the same time made the exact duplication of documents a matter of routine, while simultaneously eliminating the possibility of errors due to hand copying. The typewriter also eliminated the problem of illegible handwriting. Now, businesses could send invoices and correspondence, while keeping duplicate copies, and could send identical communications to various persons and departments without the need to hand-copy each

page. It was asserted that as many as 30 typed copies could be produced at once, although the average was certainly far below that [4, p. 121]. By 1890, 17 years after its commercial introduction, the typewriter was found in most business offices. It was the unusual business firm that had not yet adopted it.

Of prime importance to all businessmen was the cost of employing the increasingly needed office workers. In this respect, the relatively low wages accepted by women gave them a distinct advantage over their male counterparts. They were cheaper than men by as much as one-half to two-thirds. Relative wages were also an important supply side factor. Although women's wages in the office were significantly lower than men's, they were significantly higher than factory wages for women. At the end of the 19th century in northeastern American cities, domestic servants earned $2.00 to $5.00 a week, and factory operatives $1.50 to $8.00 a week, but typists and stenographers earned $6.00 to $15.00 a week, as much as 10 times more than factory and servant work [6, pp. 9-10; 4, Ch. 11]. Thus, in very simple economic terms, females were attracted to typing despite receiving lower wages than men, and employers were attracted to female typists. For women, typing was clearly a step up the economic and social ladder, and inequitable wages were insignificant given the society and ideology of the late 19th century.

The precedent for this particular wage differential and for women entering the clerical work force was set during the Civil War and reinforced by then prevailing social notions. General Francis Elias Spinner, US Treasurer, helped solve the shortage of manpower in the nation's capitol during the Civil War by employing women. They first trimmed money at the Treasury Department, but gradually moved into other clerical jobs. In 1869, Spinner declared "upon his word," that "some of the females [were] doing more and better work for $900 per annum than many male clerks who were paid double that amount" [8, p.7]. Male clerks then earned between $1,200 and $1,800 a year. Thus, the pioneering efforts of Spinner continued after the war and to some undetermined degree prepared the way for women typists.[9]

In response to business demand for trained typists, business colleges, which previously taught pennmanship and mathematics, began to offer typing courses. Typewriter agencies and independent businesses began to offer transcription services, and some typewriter sales offices offered an employment service of sorts, providing typewriter and typist as well as training. The New York City YWCA through its Ballard School offered a typing course in 1881. The "well-meaning but misguided ladies" of the Y apparently perceived the strong demand for typists and offered a six-month course to 8 "stong women" after purchasing six Remington typewriters [2, p. 35].[10] These women were evidently quite successful despite the prevailing notion that the "female mind and constitution were

not considered equal" to the task. The Y, along with Remington's various agents, apparently offered the first formal typewriting instruction. By 1890, some 1,300 private schools of stenography and typing were in existence, clearly a reflection of the demand for typists [12].[11] The influence of the YWCA is inclear, but seems to be significant. The Y was certainly not the first to suggest that women would make excellent typists, but this institution appears to have been the first to take concrete steps to introduce the change.

A particularly important factor in the feminization of the office work force was the status of office work with respect to alternative employment opportunities for women. The employment opportunities facing a woman around 1885 were teaching, nursing, clerking, domestic servant work, factory work, immediate marriage, or the business office, and they may have induced many women to ignore the wage differential in accepting office work. Between 1820 and 1860, women had moved into the once male-dominated teaching profession, apparently because they were cheap substitutes for the dwindling supply of male teachers. Women had traditionally worked as textile mill operatives, seamstresses, and servants, as well as in many light industries such as the watch factories (where they had been employed since their origin in the 1850s), paper box making, shoe manufacturing, packing houses, and so on. Both factory and servant work carried a social stigma, and work in either one was generally believed to contribute to the deterioration of a woman's morals, especially in less skilled jobs [4, p. 117-18; 2; and 6]. "Lower class" employment was associated with "lower class" morals. As Edward Bok, editor of the *Ladies Home Journal* noted, office work was the "best paid and most respectable employment for a young woman" [6, p. 28][12] Not only was the atmosphere of the office superior to that of the factory, but the work was less strenuous, required more intellectual and less physical labor, and left the operative with some energy for housekeeping and a social life at the end of the day. Indeed, the social aspect of life was not insignificant. The educated middle-class woman who secured office employment often found that the the business office was an excellent place in which to seek a well-bred husband. At least, the office provided respectable employment at good wages (for a woman) until she married, and indeed this seems often to have been the case. The vast majority of women office workers were single, unmarried, and under 30 years of age, and the average age stayed under 30, suggesting a relatively high rate of turnover. Typically, they worked until they married and their husbands supported them, whereupon they quit [4, p. 118; 2; and 6]. It is still unclear whether the lack of effective birth control devices virtually ensured the secretary's early retirement after marriage.

Closely related to the aspect of status in typing is the labor pool from which many typists came. These young women were generally high school graduates from middle-class, urban households for whom factory and servant positions were not "morally acceptable" jobs. Typing was one respectable avenue. Exactly why there were more female high school graduates than men in the late 19th century is unclear. Nevertheless, in 1880 they outnumbered men by 2,500 and in 1900 by some 19,000 [6, p. 5].[13] The business office, of course, demanded an educated work force. Clerks and typists had to be able to read, write, and execute minimal mathematical skills. Here, the high-school-educated women had an advantage.

Typing as a new job, a new profession, was associated neither with men nor women. It was "sex-neutral" and as such was not only open to both men and women but not automatically closed to women, as were so many other occupations. Traditionally, it seems, women often moved out of the home into developing industry only in those occupations they had performed at home, such as textile mill work and garment sewing. Only in a relatively few cases, such as teaching, did they become dominant in traditionally male occupations. The new profession, typing, was not tradition-bound. Furthermore, since opportunities in the business office were generally expanding, women were not competing with men for existing jobs, nor were they pushing men out of work. Women simply filled the newly created positions. Not only was the job of typing "sex-neutral", but there was no sex-based competition for the new employment [6, p. 9][14]

Margery Davies has emphasized the shift in ideology concerning the special qualities of a woman and the role of women's rights activists. Despite their successful entrance into office work during the Civil War, women were at first generally resented. They were seen as frivolous creatures, given to gossip and constant preening, and possessed of a natural inability to perform an honest day's work. Some saw women typists simply as an aspect of the woman's rights controversy. These individuals argued that a "woman simply could not produce as much good work as a man because of unblinkable facts of nature: every four weeks she lost temporarily a fifth of her 'vital power'" [4, p. 119]. Feminists replied, however, that "men were more frequently absent (from work) because of their vices." Nevertheless, by the end of the century the qualities attributed to women office workers had changed, and the argument was over. According to one anonymous writer, fully 50 percent of the woman's value in the office could be ascribed to her personality, which had two aspects: (1) "She should make the most of her personal equipment," and (2) "the more important element... involved her temperament." "She must be adaptable, agreeable, and courteous." "Woman," stated a later anonymous writer, "by virtue of some of their most womanly traits are capable of making the office a more pleasant, peaceful, and homelike

place." It was believed that women's naturally passive and docile nature suited them ideally for routine tasks, and they were unlikely to compete with their male bosses. In referring to stenography and typewriting in 1996, one feminist declared: "Here it is admitted that women are superior to men, their great quickness of perception and motion giving them obvious advantages" [4, p. 119]. Perhaps ironically, for today's feminists, the "manual dexterity of women" argument appears to have come from one of their own kind.

Loyalty was still another female attribute which reportedly made women attractive candidates for office employment. As one feminist stated in 1891,

> Businessmen tell me they prefer women as shorthand amanuenses for one particular reason. It is because, contrary to tradition, women are less likely than men to disclose the business secrets of their employers. Then too, they are most apt to remain for a long period in the service of one employer. [4, p. 119]

Furthermore, women were thought to be more sympathetic than men, thus providing moral support for their bosses. They were believed to be temperamentally, physically, and emotionally superior to men for office work. There seems little doubt that early feminists had much to do with creating the stereotyped stenographer [6, pp. 15-20].[15]

The final supply-side consideration is the iconography of typewriters. It takes three forms: (1) promotional trinkets distributed by typewriter companies and office material companies, (2) magazine advertising, and (3) the picture postcard.

Promotional trinkets include such items as a small hand mirror which advertised the Oliver typewriter, and a typewriter ribbon tin with a pin-cushion top which constantly reminded its user of the Webster Ribbon Company.[16]

Typewriter advertising in magazines, when it was not stressing the technical superiority of a particular machine, almost invariably showed a woman typist. The company concerned made absolutely no difference, be it Remington, Underwood, Hall, Williams, Duplex, Franklin, and so on.

Third, there was the picture postcard craze of the late 19th and early 20th century. The Milwaukee Public Museum collections contain 17 picture postcards concerning women in the office. In every case, the woman is associated with the typewriter, in a "secretary-employer relationship" which carries very strong sexual overtones. The postcards are fairly late, variouly dated between 1900-1937, and they may tend to reflect and reinforce, rather than establish, the trend.

The importance of early advertising deserves a closer look. Indeed, advertising may have played a central role in establishing the female typists. In the beginning, the manufacturers and promoters of the typewriter apparently did not realize that business

offices would become their best customers. Indeed, they thought of the typewriter as a literary machine, not a business machine. They went so far as to call it "the literary piano," expecting that novelists and poets would compose at it, much as musicians composed at the piano [4, p. 9].[17] Their advertising reflected their uncertainty about potential markets, and attempted to reach anyone and everyone who might conceivable be interested. This shot-gun approach to advertising included women. Sholes's daughter, photographed using the machine in 1872, was pictured early and often.

One of the earliest typewriter advertisements appeared in December 1875, only a year and a half after the typewriter had been introduced commercially. The firm of Locke, Yost & Bates (selling agents for the Remingtons) offered the following:

> And the benevolent can, by the gift of a "Type-Writer" to a poor, deserving, young woman, put her at once in the way of earning a good living as a copyist or corresponding clerk. No invention has opened for women so broad and easy an avenue to profitable and suitable employment as the "Type-Writer," and it merits the careful consideration of all thoughtful and charitable persons interested in the subject of work for women. Mere girls are now earning from $10 to $20 per week with the "Type-Writer," and we can at once secure good situations for one hundred expert writers on it in counting rooms in this city (New York). [8, p. 79]

Although only a short portion of the Locke, Yost & Bates advertisement has been quoted, and most of the ad appeals to "Editors, authors, clergymen" and families -- as well as business and government, several unmistakable themes appear. Note the phrases "profitable and *suitable* employment," "the poor, deserving, young woman," the "mere girls" earning "$10 to $20 per week," and the "good situations for one hundred expert writers."

It is tempting to speculate about the influence of such advertising on the YWCA and its subsequent influence on other business schools, but that is the subject of another paper.

It is safe to conclude, at least, that early advertising appealed to *both* male and female prospective typists, and that a shift in its content occurred quickly. By the mid-1880s, men all but disappeared from advertisements, inextricably linking women and typing. This trend continued at least until 1940.[18]

In closing, the typewriter alone was not responsible for bringing women out of the home and into the office. Nor was it merely an "appropriate invention" of which "a purely *social* process" took advantage, in George Daniels's terminology [5, p. 200-201]. The typewriter was only one of a number of technological, social, and economic forces present in the late 19th century. However, the successful mechanical writing machine as developed by Sholes

and manufactured by the Remingtons was born outside these forces. It was not so much the product of these upheavals as the catalyst, the crucial element which united the existing forces and sparked the change. The entrance of women into certain sectors of the work force and the profound social and economic changes that took place in the late 19th century would probably have occurred eventually even without the typewriter. Nevertheless, they did occur when they did in large part because of the typewriter, and our society has assumed a particular shape as a result. As a society, our notions were largely shaped by the stereotypes created before 1910 by the initial promoters of the mechanical writing machine. It is about the promoters, the inventor of the ribbon tin-pin cushion, the Williams advertising director, and the copyman for Locke, Yost & Bates, that we know so little. These are the men who, influenced by the typewriter itself, shaped much of our society.

One final note about the role of demand and invention. Concerning medieval agriculture, Lynn White, Jr. has written "Necessity explains nothing until the need is felt" [14, p. 144]. His analysis also describes the late 19th century business community. No one in business was striving to invent the typewriter. It was clearly exogenous to the business sector. However, once business realized all that the typewriter could do, the machine was adopted at an extremely rapid rate. The reaction by business firms came as a surprise to the typewriter's promoters, who, as the 1875 advertisement indicates, were trying to appeal to anyone and everyone, including business. Sholes, the inventor, was a visionary character, and although the invention itself quickly passed into the hands of entrepreneurs, its origin was in the mind of a dreamer.

NOTES

*Very special thanks are to Cheryl Castelli who typed all the drafts of this paper. Anyone who believes that typing is not a skilled profession should observe Cheryl Castelli at work. The speed and quality of her work have given me an insight into the nature of typing.

This work-in-progress paper attempts to raise the issues and identify the important questions concerning a well-known story in American technological history. It is, in essence, a survey of the existing literature and ideas with relatively few new and original contributions. There is virtually no solid data available with which to support the current conceptions about women office workers. For example, there is no comprehensive list of 19th century typewriter manufacturers (I am skeptical of my preliminary count of 58 such firms) nor of total typewriter production in the century (I am even more skeptical of my preliminary tabulation

here: 1,800,000 machines, of which 1,300,000 were of office quality). In short, far from providing any final answers, this paper draws the outlines for further research. Let me stress the tentative nature of the conclusions reached and extend an invitation to correspond with anyone having additional ideas, data, or criticism.

1. This is no attempt to attack Boorstin, but simply to illustrate the widespread acceptance of this simple exploration concerning the relationship between the woman and the typewriter.

2. I find this same story in [2, 7, 11, and 15]. With little trouble, this list could easily be extended. George Daniels [5] observes that the story is repeated in most history textbooks.

3. For accounts of these and other machines, see generally [1 and 2]. Typewriter and office machine collecting has been quite active in England for the past 10 years or so, a fact to which these two highly illustrated collectors' books testify.

4. The best source for the development phase of the typewriter remains R. H. Current [4].

5. P. G. Hubert's eight-page article was removed from some popular magazine before the turn of the century. I found this copy in the files of Edwin Battison, for whom I worked several summers at the Smithsonian's Museum of History and Technology. Page 25 carries the date "A.D. 25-Apr. 1888." Hubert gives only the Remington production data for 1882 and 1887. The 1881 figure comes from [13, p. 49].

6. *Radical America* describes itself as an "independent Marxist Journal" which analyzes "The history and current conditions of the working class in North America and Europe, shop-floor and community organizing, history and politics of women's liberation, contemporary socialist theory and practice, and popular culture." It is, like so many academic journals, relatively obscure, and Davies's article is currently unknown among technological and economic historians. Davies seeks to explain how women came to enter and dominate numerically the office workforce, how the ideology concerning women office workers changed, and how that ideology and the resulting segmentation of the clerical work force by sex led to worker exploitation, especially women workers. Davies, like all the other authors who have addressed this issue, notes a series of simultaneous trends which logically should have influenced the inflow of women into the office, viz, wages, education, increasing office size, and so on. Yet the relationship between these trends and the increasing number of women office workers remains assumed and not proved. I hasten to point out the same weakness in this paper.

7. There is some question about the ability of the new industry to supply the sudden demand that appeared about 1883-85. One explanation for the unusual typewriter designs which appeared in the late 1880s and early 1890s is that the demand was so strong that almost any workable design would sell. The new manufacturers

who entered the market with the unusual machines were quickly driven out as the makers of more conventional machines increased their output.

8. The data to explore exactly what industries were expanding, at what rates, and how that directly influenced the size of the office staff have not yet been gathered. The reader must assume that the qualitative sources are correct until data is available to confirm or disprove the trend. A dissertation by Elyce Jean Rotella entitled "Women's Labor Force Participation and the Growth of Clerical Employment in the United States, 1870-1930" (University of Pennsylvania, 1977) undoubtedly sheds light on the subject, but has not been incorporated here due to the late date at which I learned of it.

9. The Herkimer County Historical Society's book offers the intriguing information that Spinner was a Mohawk Valley resident and knew the Remingtons. They even reproduce a letter from the Remingtons to Spinner. How Spinner's pioneering ideas about women in the office influence the early Remington advertising policy may be quite important. (See discussion of advertising which follows.)

10. Various authors have jumbled the facts of the YWCA school. Some say it opened in 1879, some cite six women, and so on. The confusion here (and elsewhere) further emphasizes the preliminary stage of research and the primitive character of the data.

11. Rockwell's tables list not only each institution's location, name, primary teacher, and student population, but also the brand of typewriter used by the school. The Remington, Caligraph, and Hammond dominate this list.

12. The date of this quotation is unclear.

13. It is unclear if a high school diploma really made any difference. The primary educational requirements seem to have been stenographic and typing skills, not general education. Obviously, literacy was a requirement. An essential point here is that the stenographers and typists were highly skilled laborers, and the positions they filled could not be filled by unskilled, illiterate women. To the degree that the high school diploma accurately measured literacy, the higher number of female graduates compared with male graduates is a factor.

14. I had also, independent of Davies [6], arrived at this same idea, only to discover that I had been preceded into print.

15. Davies [6] emphasizes and elaborates the shift of ideology first noticed by Current [4].

16. This paper, as delivered to the Business History Conference on 3 March 1979, in New Orleans, was illustrated with slides. For further information and copies of the slides, please address correspondence to me, c/o the Milwaukee Public Museum, 800 W. Wells St., Milwaukee 53233.

17. I have seen this term elsewhere as well, but am not sure of the source.

18. I base my belief on the Milwaukee Public Museum's collection of 650 typewriter advertisements, accumulated at random over the last 30 years. For additional information see Note 16.

19. This eight-page article was removed from some popular magazine before the turn of the century. I found this copy in the files of Edwin Battison, for whom I worked several summers at the Smithsonian's Museum of History and Technology. Page 25 carries the date "A.D. 25 Apr. 1888." Hubert gives only the Remington Production data for 1882 and 1887. The 1881 figure comes from Agnes Rogers [13, p. 49].

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15. Mitchell Wilson, *American Science and Invention* (New York: Crown Publishers, 1954).