FRANK H. HALL AND HIS BRAILLE WRITER

by Walter B. Hendrickson

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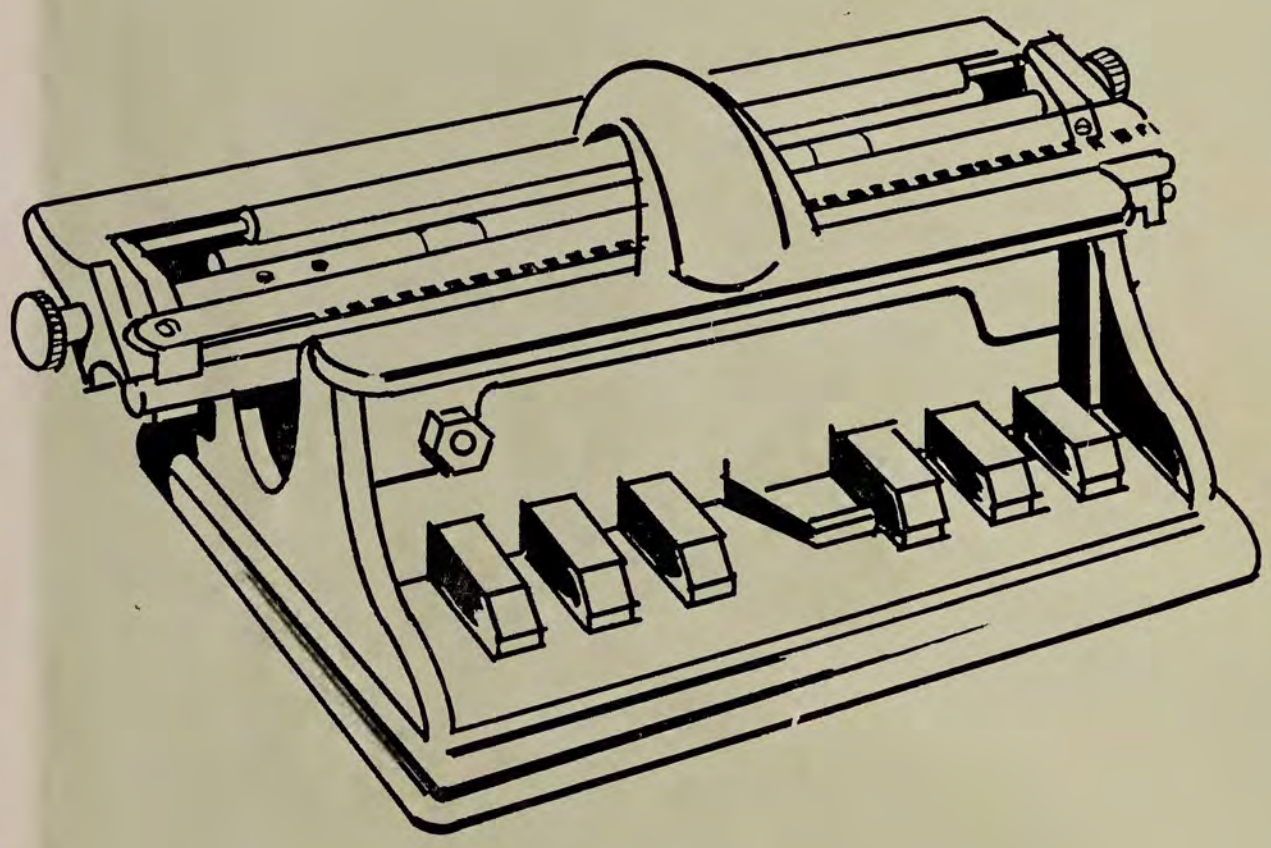

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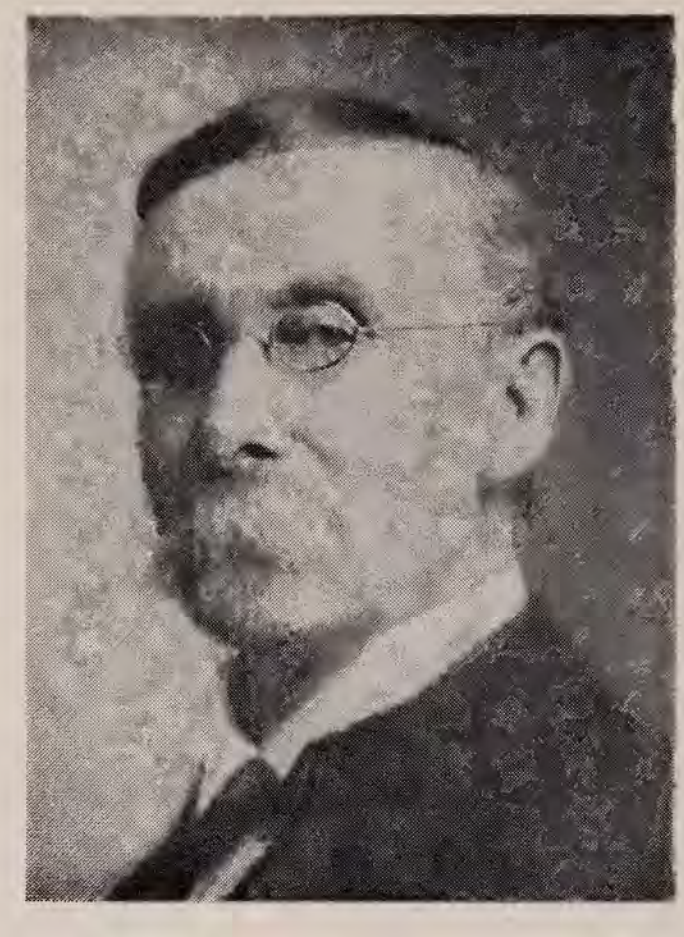
Walter B. Hendrickson, professor of history at MacMurray College in Jacksonville, Illinois, is a teacher of American history, and a writer on social and cultural aspects of United States history. Born in Indianapolis, Indiana, in 1903, he was educated in the public schools, earned his baccalaureate degree at Butler University, his M.A. in history at Indiana University, and his Ph.D. at Harvard University. He has been at MacMurray College since 1940.

The substance of his story of Hall and his braille writers was first given at a meeting of the Illinois State Historical Society in Jacksonville in 1955. Since then Professor Hendrickson has continued to follow developments in the education of the blind, and the present account is a complete rewriting and updating of the original paper.*

* I wish to express my appreciation to former Superintendent Leo J. Flood, and to former Superintendent of Blind Services Louis W. Rodenberg, both deceased; and to Miss Helen Sweeney, teacher and curator of historical materials, and Jack R. Hartong, superintendent, all of the Illinois Braille and Sight Saving School, for supplying me with necessary materials, and for their patient explanation of technical aspects of the education of the blind. The responsibility for the facts and conclusions, however, rests with me alone. I wish also to thank the editors of *The New Outlook for the Blind* and *The Illinois State Historical Society Journal* for permission to use parts of articles written by me in those publications in 1955 and 1956, respectively.



FRANK H. HALL

AND HIS BRAILLE WRITER

By Walter B. Hendrickson
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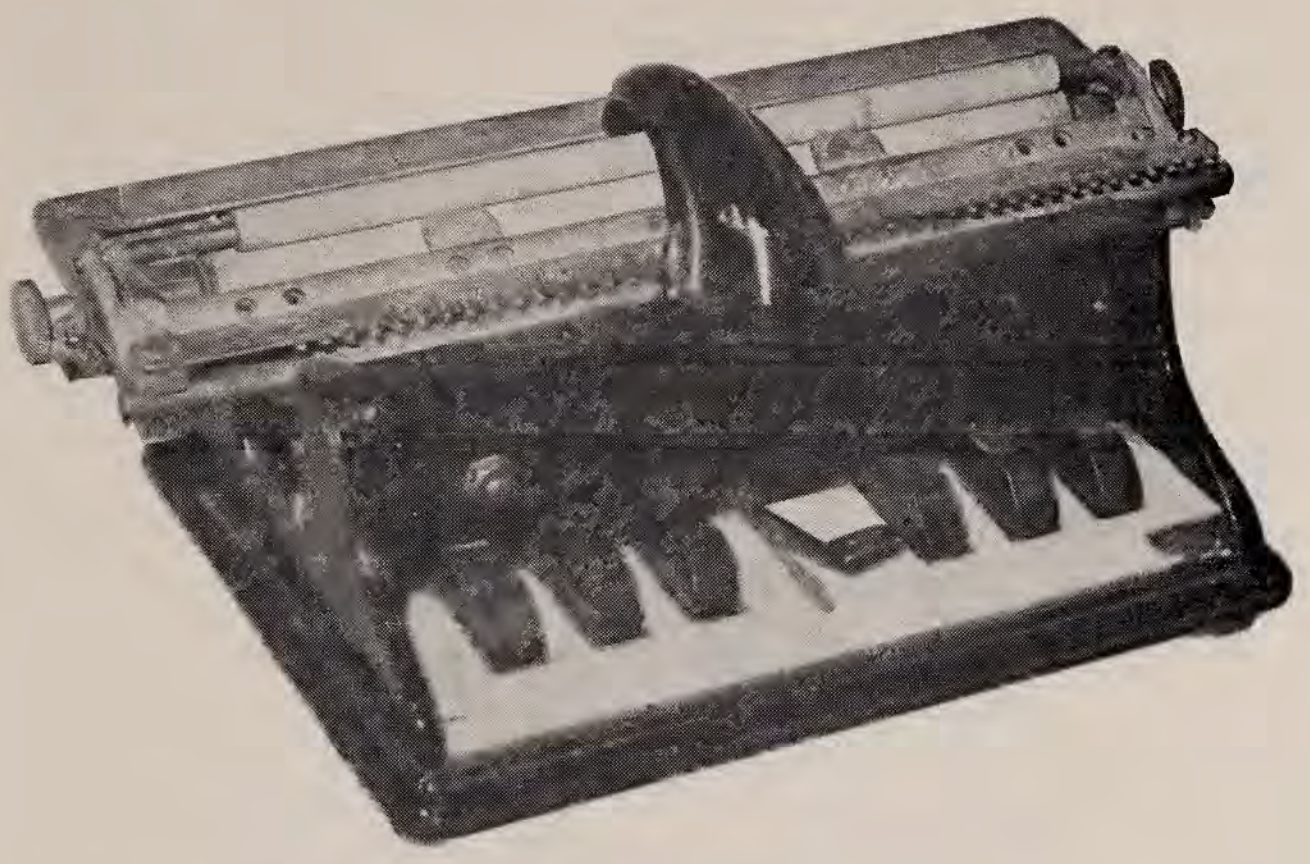
It was clear, cold, and quiet on the morning of January 5, 1893, when a man of medium height and vigorous physique, bright-eyed and bespectacled, his face adorned with a soup-strainer moustache and a small goatee, jumped lightly from the Chicago and Alton train that pulled into Jacksonville, Illinois, from Chicago, and hurried forward to supervise the unloading of a large wooden box onto a wagon. He climbed up beside the driver, and the horses hauled the rattling vehicle a couple of hundred yards eastward across the railroad tracks and pulled into the rear of the main building of the Illinois Institution for the Education of the Blind. The box was unpacked and the contents set up in the office of the man, who now had his greatcoat off and appeared in a high stiff collar, black tie and black frock coat. This man was Frank Haven Hall, superintendent of the institution.[1]

Out of the box came a machine that operated somewhat like a typewriter. It had six keys, much like those of a piano, and a single oval spacing key between two groups

1. This incident is a reconstruction based on an article by John B. Curtis, "Frank H. Hall," in *The Outlook for the Blind,* v. 3 (1911), p. 5. The story was also told to me as a tradition of the School for the Blind by the late Louis W. Rodenberg in an interview, Mar. 3, 1955. The date is fixed by a statement in Frank H. Hall, "The Story of an Invention," in *The Mentor,* v. 3 (1893), p. 72. (*The Mentor* was a magazine published by the alumni of the Perkins Institution from 1891 to 1894.) Also, an article in the *Jacksonville Journal,* Jan. 6, 1893, said that Hall had returned from Chicago with the machine the day before. An advertisement of the Chicago and Alton Railroad in the same newspaper established the fact that there was a train in from Chicago about midnight.



of three keys. Each key controlled a punch that made one of the dots in a braille cell. At the back of the machine and attached to it in a vertical position — where, in a typewriter, the paper would be inserted — was a metal frame about 15 inches square. The machine was mounted on a waist-high pedestal, and extending downward was a single foot pedal. By pressing the keys, and stepping on the foot pedal, the dots of the braille letters were impressed on a thin brass sheet held in the upright frame. The resulting embossed plate was put into a hand press, a dampened piece of paper was placed over the plate, pressure was applied, and the braille characters were transferred to the paper. Thousands of copies could be made — no fuss, no muss, no type, no hot lead. Frank Hall, whose brainchild this machine was, put a plate in the carriage and tapped out four lines of the first verse of the hymn, "Blest be the Tie that Binds."[2]

The stereotyper was the full brother of the braille writer developed by Hall in 1892. The latter was a machine with which blind persons could write on paper so that it could be read by other blind persons, much as seeing persons used the typewriter. Together the Hall braille writer and the Hall stereotyper revolutionized the education of the blind.

2. Hall, "The Story of an Invention," *loc. cit.*, p. 68. Hall said, "four lines of a favorite hymn," but Mrs. Bess Bower Dunn, who was a pupil of Hall's in the Waukegan, Illinois, schools, 1893-1897, and knew Hall and his children, said that "Blest be the Tie that Binds," was sung every morning at the School for the Blind. Miss Dunn to me, Waukegan, June 21, 1955. Letter in my possession. Throughout this paper, when the notation invented by Louis Braille is mentioned, the word will be spelled with a lower case b, as is the practice in most publications. In Hall's day the word was always spelled with a capital B. I have also done so when direct quotations are given.

This man, who could not wait until daylight to put his invention to work, had become the superintendent of the Illinois Institution for the Education of the Blind in 1890 after a 25-year career as a teacher and principal of both public and private schools in Illinois. He was born in the town of Mechanic's Falls, Maine, on February 9, 1841, and served in the Union Army in 1862-63 as a hospital steward in the 23rd Maine Volunteers — a "nine-months" regiment. After he was mustered out, he spent a short time at Bates College, and in 1864 he began to teach.[3]

In 1866 Hall came to Earlville in northern Illinois as superintendent of schools. In a couple of years he moved to the larger town of Aurora, where he won the job over 34 other applicants. He was an inspiring teacher and popular with his students. He also had the full support of the trustees because he was an economical administrator. He firmly replaced older pedagogical techniques, such as learning by rote, with newer ones that emphasized the application of abstract knowledge to concrete situations. Following this principle he drastically revised the widely used Werner arithmetic books, and during his lifetime, he also wrote or edited 18 other school books. Hall also believed wholeheartedly in the idea that schools should prepare children to assume adult responsibilities, including the business of making a living. He was therefore a strong advocate of vocational education.[4]

In 1875 Hall left the public schools to head a private work-and-learn school at Sugar Grove, near Aurora. At the Sugar Grove Industrial School, as Hall said, "We learned to use the milk tester and we read Shakespeare. We investigated the subject of cattle raising and studied Virgil. We learned how to raise hogs and reveled in the beauties of Homer. We studied the subject of grasses and mastered cube root."[5] In the 12 years Hall was at Sugar Grove, he had an opportunity to try out his ideas that education should not be divorced from daily work, and that the purpose of any school was to teach "life-lessons."[6] Both of these convictions guided his later work in education at the School for the Blind.

At Sugar Grove, Hall also ran a general store, served as postmaster, and became familiar with the practical problems of the farmer. The latter knowledge, coupled with what he

3. For these and other biographical facts see *The Lyre*, v. 2 (Feb., 1911), p. 5. This little magazine was edited and published by Harry R. Detweiler, Hall's son-in-law. Further information is in *Frank H. Hall*, a memorial brochure. While no author, publisher or place is indicated in the brochure, it was written and edited by Hall's daughter, Sybil Verne Detweiler, in Aurora in 1911, the year of Hall's death. See Dorothy Detweiler West to me, Aurora, Ill., Mar. 13, 1955. The letter is in my possession.

4. *The Lyre*, p. 5; Frank H. Hall, a brochure, p. 20; Bess Bower Dunn to me, June 21, 1955.

5. *Frank H. Hall*, a brochure, p. 19, 21.

6. *Ibid.*, p. 23, 45-46.

had learned as a boy when he had worked in Maine factories, gave him a familiarity with mechanical principles that he often applied in his school work. He frequently provided some homemade device for studying arithmetic or geography, and the braille writer, the stereotyper, and a machine for making maps from embossed metal plates were outstanding examples of his ingenuity.[7]

Hall left Sugar Grove school in 1888 to become the superintendent of the Petersburg, Illinois, schools but returned to Aurora for a year. In 1890 he was appointed to head the Illinois Institution for the Education of the Blind on the recommendation of N. W. Branson, a trustee of the school whom Hall had known at Petersburg.[8]

When he assumed his new position, Hall knew little about the special methods of teaching the blind, but he was convinced that blind children, like normal children, should become self-supporting adults. To prepare himself, he made a trip East to visit the schools at Boston, New York, Baltimore and Philadelphia, and on the way home he stopped at the American Printing House for the Blind in Louisville, where he became familiar with type and presses and printing methods used to provide reading material for the blind.

During his first year at Jacksonville, Hall observed what went on in the school, and he read and studied about the problems of teaching blind children. He discovered that the education of the blind had always demanded mechanical devices utilizing touch and hearing to compensate for the loss of sight. Knotted strings, pins in cushions, embossed type of many shapes, and punctiform symbols of several kinds — all had their champions in the eighteenth and nineteenth centuries as the means of silent communication. It was Valentin Haüy, a Hungarian living in France in the last half of the eighteenth century, who first conceived the idea that the blind could read by feeling embossed letters with their fingers. Haüy and many of his successors used conventional type forms, but the results were not entirely satisfactory. Other educators invented special types like the Moon alphabet with its large-sized angular characters, and Boston Line Letter, a simplified Roman type.[9]

7. John B. Curtis, "Frank H. Hall," *loc. cit.*, p. 5.

8. *Frank H. Hall,* a brochure, p. 22.

9. There is a very large literature on writing for the blind which may be conveniently located in Helga Lende, *Books About the Blind: A Bibliographical Guide to Literature Relating to the Blind* (New York, 1953), and yearbooks published by the American Foundation for the Blind. A clear and accurate account written for the layman is Ishbel Ross, *Journey into Light: The Story of Education for the Blind* (New York, 1951). More professional is Paul A. Zahl, ed., *Blindness: Modern Approaches to the Unseen Environment* (Princeton, 1950), reprinted in 1963. Brief but authoritative is Louis W. Rodenberg, *The Story of Books for the Blind* (New York, 1952). See also *Apparatus for the Blind*, International Congress on Technology and Blindness, *Proceedings* (1962), 4 vols.

Some educators abandoned the use of type and adopted punctiform letters. The founder of this system was Louis Braille, a teacher in France. His system of embossed dots was built on various arrangements of six dots in a "cell" two dots wide by three dots high, with each cell representing a letter. It was adapted in various ways in different places in Europe and the United States. In England and Europe the trend was toward the use of abbreviations and contractions for words, but in the United States, the words were spelled out, although by the end of the nineteenth century there was a movement sponsored by the Perkins Institution in Boston for a simplified braille.[10]

At the Illinois school, Hall found that Boston Line Letter, braille and New York Point were all in use. The latter was a punctiform system using a cell two dots high and varying in width from one to four dots, the number of dots being based on frequency of use, with "e" being a single dot. The system had just recently (1888) become the officially recognized form at the Illinois school, as it was at all United States schools except the Perkins Institution in Boston and the Missouri school in St. Louis. But braille had been used since 1876 by students and teachers, and even after 1888, Hall found that braille continued to be favored by many, and was commonly used in private correspondence.[11]

Hall also found that two major ideas about the education of the blind prevailed. The first was that the blind child should be kept busy with handwork and the rudiments of reading, writing, and arithmetic, not so much for learning's sake, but rather to keep the child occupied so that he would not lead a life of "monotony, uselessness and weariness."[12] Such handicrafts as broom making were also taught, and this did enable some persons to be partially self-supporting when they left school. Generally, however, such activities were carried out in special workshops maintained by the state.

In the 1870's, under Superintendent F. W. Phillips, more attention was paid to "literary" subjects, since books in raised print were available, and the children were graded in classes approximating those of the public schools. Further, to make students more self-reliant, military drill and gymnastics were provided.[13]

10. In addition to the sources noted above, see Mary Cadwalader Jones, "The Education of the Blind," in *Scribner's Magazine,* v. 12 (1892), p. 373-87, for a friendly account of New York Point.

11. "Report of Arthur Jewell, Printer," in Illinois Institution for the Education of the Blind, *Thirtieth Biennial Report* (1908), p. 15-16.

12. Helen M. Sweeney, Changes in the Philosophy of Education at the Illinois School for the Blind. Ms. p. 6. Miss Sweeney kindly permitted me to use this informative paper. The quotation is from Superintendent Joshua Rhoads' report of 1853.

13. *Ibid.,* p. 9, 11.

In a sense, Hall combined these two methods and introduced a third. He believed that the blind should be trained to work in the world of sighted people. For Hall this meant (1) that the academic side of the educational program should be brought up to the level of schools for the sighted and (2) that many more opportunities to learn trades and skills should be given to the blind child.[14] To fulfill the latter program, typing, bookkeeping, dressmaking, woodworking, and other handicrafts were introduced. But Hall's great work was in realizing his first aim, and he recognized that if the blind person was to have an equal chance with the sighted person, he would have to have the same kind of formal education.

Hall saw that the pressing need at the Illinois school, if this aim was to be achieved, was for teaching materials that would give the blind child an awareness of the world around him through the senses of touch and hearing, and at his recommendation, the state legislature appropriated $3,000, a part of which was spent for a collection of natural history specimens and "such manufactured articles as could be gotten and profitably handled by blind pupils."[15]

Another part of the appropriation was spent for two small hand presses and fonts of Boston Line, New York Point, and braille type, so that students could be provided with lesson sheets and other material from which they could study. Hall found that the chief way that students were getting information was from the dictation of their teachers. The students used a slate, which was a metal or wood frame for holding a sheet of paper, and a stylus, a pointed instrument for impressing the dots of the New York Point in the paper.[16] With type and printing press, a much greater variety of materials was thus made available.

But there were still difficulties. Not every student could learn to read Boston Line, and note taking and the preparation of written assignments were slow with slate and stylus. The officially adopted New York Point notation, in Hall's view, was not as easy to learn as braille. There was a simplicity and uniformity about braille, with its three dot high and two dot wide cell, that New York Point did not really possess, although it appeared to. New York letters were only two dots high, but the letters varied in width, so if one became expert, he could write a little more rapidly than could the user of braille. On the other hand, the regularity and uniformity of the braille cell made it favored

14. Frank H. Hall, "The Education of the Blind," in Trustees of the Illinois Institution for the Education of the Blind, *Twenty-fifth Biennial Report* (1898), p. 9; Frank H. Hall, a brochure, p. 22-23.

15. Trustees of the Illinois Institution for the Education of the Blind, *Twenty-second Biennial Report* (1892), p. 11; Sweeney, *op. cit.*, p. 13.

16. "Report of Arthur Jewell, Printer," *loc. cit.*, p. 15-16.

by many blind people who knew both braille and New York Point.[17]

If there was a better way to provide teaching material, through the use of a mechanical device, what form of notation should be used? This was a question with which Hall struggled. As he discussed the matter with students and teachers, he came to see that the form of the machine and the kind of letters were intimately associated. It would be much simpler to make a machine analogous to a typewriter using braille, since every letter would be of uniform width. Concerning the machine itself, Hall said:

> It was obvious at the outset that such a machine must be quite simple and easy to manufacture, thereby placing the cost within the limited means of the poorest of the class it was designed to benefit. Next it must have power sufficient to emboss the points of the Braille system in perfectly sharp relief, and yet the touch must be easy, giving the greatest rapidity without fatiguing the operator.[18]

It was at this point that Hall sought technical assistance and called upon G. A. (Gus) Sieber. Gustav Sieber, born in 1863, was the son of a German immigrant, who opened a gun shop in Jacksonville at 213 East Court Street, just off the public square.[19] Young Gus had learned early the gunmaker's art in his father's shop, and he became skilled in general metal work through three years' experience in Chicago machine shops and foundries. As Sieber told the story, "[Hall] showed me what he called a slate and stylus to punch dots in paper and wanted a writer to do this work."[20] Hall explained about the braille system of six dots in a cell and told Sieber that he wanted a machine, like a typewriter, in which each dot would be controlled by a separate key, so that any braille character could be made at a single stroke by pressing the right combination of keys.[21]

17. For the "Battle of the Types" see the account of the hearings before the committee of the New York [City] Board of Education in 1909: "Which Tactile Print for New York City?" in *Outlook for the Blind*, v. 3 (1909), p. 24-46, 64-74.

18. Hall, "Story of an Invention," *loc. cit.*, p. 68.

19. Interview with Sieber, May 1, 1955. He was then 92 years old, still in good health and clear of mind, although very deaf. He retired only a few years earlier from active participation in his electrical contracting business.

20. Written statement of G. A. Sieber, April 1, 1955, answering questions put by me.

21. Conversation with Louis W. Rodenberg, May 10, 1955, in which the latter said that Sieber had told him this several years earlier. Rodenberg's recollection is supported by a letter, G. A. Sieber to Robert B. Irwin, Executive Secretary of the American Foundation for the Blind, Jacksonville, June 11, 1932, in which Sieber wrote, "Hall showed me what they called a slate and stylus, showed me the work they did, and wanted a writer made on the order of a typewriter — having six keys and a spacer. He never gave me any idea as to how to make it, but what it should do." Both the rough draft of this letter, in Sieber's handwriting, and the carbon copy of the letter are in a small collection of letters and clippings which were, in 1955, in Sieber's possession. Since Sieber's statement to me, noted above, was made when Sieber was 92, and since there is no written documentation contemporary with the making of the model of the writer, it seems probable that Sieber may have failed to remember all the circumstances. Sieber in his statement claimed credit for the idea of using the six keys, but this most certainly was Hall's idea.

With this information and Hall's explanation of the braille cell, and with the typewriter in mind, Sieber created a suitable machine. It is clear as one examines a Hall writer, that it is much like a typewriter in that the carriage moves one space to the left as the keys are released after a letter is impressed on the paper, and that the styli in the embossing head are actuated by the keys much as are the type bars on a typewriter. In fact, Sieber's great contribution was not only designing and making a carriage mechanism and linkage between keys and styli, but that he did it in such a way that there was no infringement on existing typewriter patents. Further, it was Sieber's design that permitted the styli to operate from the back so that the operator would make letters in the normal position for reading them, rather than the backward reverse method of the stylus and slate.[22]

The model built by Sieber is no longer in existence, but it was thus described by Hall:

> [It] was built mainly of scrap iron and was fastened to a rough pine board for a base. It was anything but elegant in appearance; but the dots made by it were fully equal to those made by the stylus, and, although the working was heavy and the machine roughly constructed, the measure of our success at this point was greater than I expected.[23]

And so, although not much notice of Sieber's part in its development has ever been made, it seems clear that the braille writer which bears Hall's name was the happy result of Hall's creative mind, which analyzed the problem and envisioned a solution, and Sieber's highly developed craftsman's skill. It is peculiarly fitting that brain and hand worked together to advance the education of the blind, which is itself so largely dependent on the sensations received by the brain from the hand.

Hall, with his driving enthusiasm and urge to action, wanted Sieber to undertake immediate mass production of the writer, but Sieber advised Hall to take the model to Chicago, where proper patterns and dies could be provided. As Hall said, "a fortunate chain of circumstances" led him to the Munson Typewriter Company where T. B. Harrison was the superintendent and C. J. Seifried was the designer. Harrison and Seifried fulfilled Hall's requirement that the braille writer should be made to sell at as low a price as possible. Hall said that their work was a "labor of love," because of the modest price they charged for making the machines — 94 of which were made for $940.[24] In addition,

22. These statements are based on my own examination of several Hall writers, and on conversations with Sieber and Rodenberg in Mar., Apr., and May, 1955.

23. Hall, "The Story of an Invention," *loc. cit.*, p. 69.

24. *Ibid.*, p. 70; "Itemized Statement of Expenses, 1893," in Trustees of the Illinois Institution for the Education of the Blind, *Twenty-third Biennial Report* (1894), p. 45.

Hall said that he paid out between $200 and $300 for pilot models,[25] which probably included the $65 paid to Sieber for his work.[26] Twenty machines were retained by the Illinois school and the others were sold to individuals and schools for $12 and later for $14.[27] Within a few years, institutions for the blind in the United States and in many foreign countries, including Australia and China, were using Hall writers.[28]

Hall was proud of the fact that neither he nor any of the persons connected with the development of the writer profited from the invention.[29] One of the favorite stories told by Hall's children was about the time that he met Helen Keller, then 13, at the World's Fair in 1893, and upon being told that Hall was responsible for the writer that she used so often, she put her arms around his neck and gave him a big kiss on the cheek. Hall's daughter said that he could never tell of this incident without tears in his eyes.[30]

Harrison and Seifried made five pilot models of the braille writer which arrived in Jacksonville on May 27, 1892, and Hall gave a demonstration to a reporter from the **Jacksonville Journal,** who wrote a most enthusiastic report a full column long.[31] The public first saw the machine at an exhibition of the work of the Institution for the Education of the Blind on June 7, 1892, when five students competed against each other in a speed trial. The winner wrote 85 words a minute from memory and 31 words a minute from dictation.[32]

In July, 1892, Hall attended a meeting of educators of the blind at Brantford, Ontario, and he took along a braille writer. He tried to get on the program to present his machine formally to the convention, but the chairman, A. G. Clement, superintendent of the New York State School for the Blind at Batavia, would not let him do so, probably because Hall's machine used braille rather than New York Point, which was favored by many teachers.[33] Hall therefore invited the other members of the convention to come to his hotel, where his daughter, Nina, demonstrated the machine, and achieved the impressive speed of 100 words a minute.[34] Edward E. Allen, the superintendent of the Overbrook School in Philadelphia, said, "We . . . who were there assembled in convention were almost dumbfounded with

25. "Which Tactile Print for New York City?" *loc. cit.*, p. 70.
26. Edward E. Allen, "Frank H. Hall," *loc. cit.*, p. 59.
27. Hall, "The Story of an Invention," *loc. cit.*, p. 70. These facts and others given here are confirmed by the correspondence in Frank H. Hall Letter Book No. 2. *passim.* Cited hereafter as HLB No. 2. Two letter books from Hall's administration have recently come to light (1968), and are now in the archives of the Illinois Braille and Sight Saving School.
28. "Which Tactile Print for New York City?" *loc. cit.*, p. 70.
29. See below, p. 17-19.
30. *Frank H. Hall*, a brochure, p. 24.
31. *Jacksonville Journal*, May 28, 1892.
32. *Ibid.*, June 8, 1892.
33. Hall to A. G. Clement, Sept. 29, 1892, HLB No. 2.
34. Hall to William B. Wait, Sept. 2, 1892, HLB No. 2.

surprise and delight. The convenience of this little machine to the blind can only be understood when one realizes that it became to them what the ordinary typewriter is to others."[35]

After Hall's return from Brantford, he was engaged in an extensive correspondence with blind persons, teachers, and heads of schools on matters pertaining to the writer. Among other things, he was promoting the virtues of braille over New York Point. At Brantford a vote had been taken among superintendents of schools for the blind, and it was found that New York Point was favored by a count of ten to nine.[36] The men who supported braille "immediately took steps to cause a portion of their money from the Congressional grant [to provide educational materials for the blind] to be used in printing braille music, . . . and thus we hope to have the presses at Louisville, before many months, striking off Braille."[37]

Hall also conceived the idea that if "intelligent" blind persons, who knew both New York Point and braille, would compare them with attention to ease of writing and reading, that braille would win out. He therefore prepared a test for the two systems and wrote to blind persons, asking them to take the test. He advocated the use of what was called Boston braille, or Improved braille over English braille, and he was pleased when his correspondents reported that they agreed with him, and found it superior to New York Point.[38]

As a result of his efforts, he gathered several testimonials for braille, and Dr. J. T. Sibley of the Missouri School for the Blind, who had been on the fence in the matter, became a convert to braille. California also "dropped into the Braille column, and Kansas . . . caught the infection."[39]

While he was converting the leaders of education for the blind to the use of braille, Hall was also corresponding with the blind persons who were using the first lot of braille writers that had been produced. He found that people who used the machine were very enthusiastic about it, and they gave Hall several suggestions for improvement, some of which he adopted. However, he rejected recommendations that the machine be made lighter and that cheaper materials be used. When he finally decided on mass production, he said that the new machines would "make less noise, handle the paper better, permit a backward motion of the

35. "Frank H. Hall," *loc. cit.*, p. 91.

36. Hall to Mr. [?] Parker, Aug. 6, 1892, HLB No. 2.

37. *Ibid.*

38. Hall to Lynn S. Pease of Janesville, Wis., Aug. 22, 1892; Hall to J. W. Smith, Aug. 31, 1902; Hall to A. M. Shotwell of Concord, Mich., Aug. 11, 1892. HLB No. 2.

39. Hall to J. T. Sibley, Aug. 31, 1892, HLB No. 2.

carriage without touching a key, click for each cell when the gauge is moved backward, and that the space-key [would be] lower."[40] Hall also publicized the writer by means of a notice in **The Mentor,** and by sending out reprints of the story in the **Jacksonville Journal.** The notice in **The Mentor** was picked up and printed in the "boiler plate" sections of newspapers, and it appeared all across the United States.[41] On September 9, 1892, Hall contracted with Harrison and Seifried for the first 100 machines.[42]

The mechanical principles of the first Hall writer were followed in later machines. So far as can be determined, C. J. Seifried took over the manufacture of the writers by himself. At his death, the Cooper Manufacturing Company of Chicago continued their production until about 1921, when the company was bought out by the M. B. Skinner Company, manufacturers of steam specialties and engineer supplies. The Skinner company made the writers under the name of the Cooper Engineering and Manufacturing Company. At first Skinner planned to discontinue making the writers because it wasn't profitable, but when he found that it would work a hardship on blind people, he decided to stay in business and produce an even better machine. He spent $5,000 for improved designs and methods of manufacture, and continued to sell the machines at a nominal price.[43] Eventually the production of Hall writers was taken over by such specialized agencies as the American Foundation for the Blind, the Howe Memorial Press, and the Braille Institute of America. Today (1968), the American Printing House for the Blind still sells the Hall writer — now named the "New Hall Braillewriter," which is like the original in appearance and in operation. The most important modification of Hall's design is found on the Perkins Brailler, where the carriage carries the styli rather than the paper.[44]

Frank Hall saw that his braille writer might be made to produce, quickly and cheaply, a stereotype plate from which many copies could be printed. Stereotypes were made at this time by laborious and slow handwork, using a punch and mallet to impress dots on copper plates, following the method developed in Europe; or, as in the United States,

40. Hall to J. W. Smith, Nov. 8, 1892, HLB No. 2. Smith was the first to suggest that both sides of the page could be written on by the braille writer. Hall didn't think this was a good idea, but it has become universal practice. Hall to Smith, Aug. 25, 1892, HLB No. 2.

41. See many letters in HLB No. 2 written in Aug. and Sept., 1892, to inquirers.

42. HLB No. 2.

43. P. D. Merrill, vice-president, Cooper Engineering and Manufacturing Company, to G. A. Sieber, Chicago, June 14, 1926. Sieber Letters.

44. The American Printing House for the Blind also sells (1968), the Lavender Braille Writer, which has the styli on the carriage, and contains a number of mechanical refinements.

by handsetting braille type, just as one did letter type, and either printing directly from it, or by making a metal stereotype from a paper matrix.[45]

After Hall returned from the convention at Brantford, he began a series of experiments, first with the braille writer, and later with a heavier experimental machine made by Harrison and Seifried, using paper stiffened by shellac; and tinfoil backed by a mixture of shellac, turpentine and litharge. Using the latter he made a number of stereotypes from which he was able to make reasonably satisfactory printed copies on his press.[46] Hall became absorbed in his experiments, saying on one occasion, "I find many difficulties confronting me in my efforts to make a stereotype on the machine. If I could gain a hundredth of an inch in height of the dot for every ten hours I spend experimenting, the dot would soon be too high!"[47]

As time went on Hall realized that he must hurry if he was to produce a really satisfactory machine. He wrote to his friend J. W. Smith in Boston, "I hope to make one more machine for working metal before the Democratic party can relegate me to the condition of 'innocuous desuetude' so far as the blind are concerned." Hall thus expressed a common view held by professional men that they should not be the subject of political patronage. He continued:

> The machine will be built at once, and will write in copper [later brass and other light metals were used], of sufficient thickness to require no backing. The styluses will simply be directed by the fingers upon a keyboard like the Braille-writer, while the embossing will be done with the foot. . . . If I can only have time to write my epitaph in Braille upon a metal hard enough to withstand such pressure as our New York Point friends will bear upon it, before my head goes to the guillotine, I will take my punishment for Harrison and Fifer without a whine or a whimper.[48]

Harrison and Fifer were, respectively, the Republican candidates for President of the United States and Governor of Illinois in 1892. Both were defeated, but Hall won **his** race, because it was this perfected machine which Hall unpacked in the small hours of January 5, 1893.

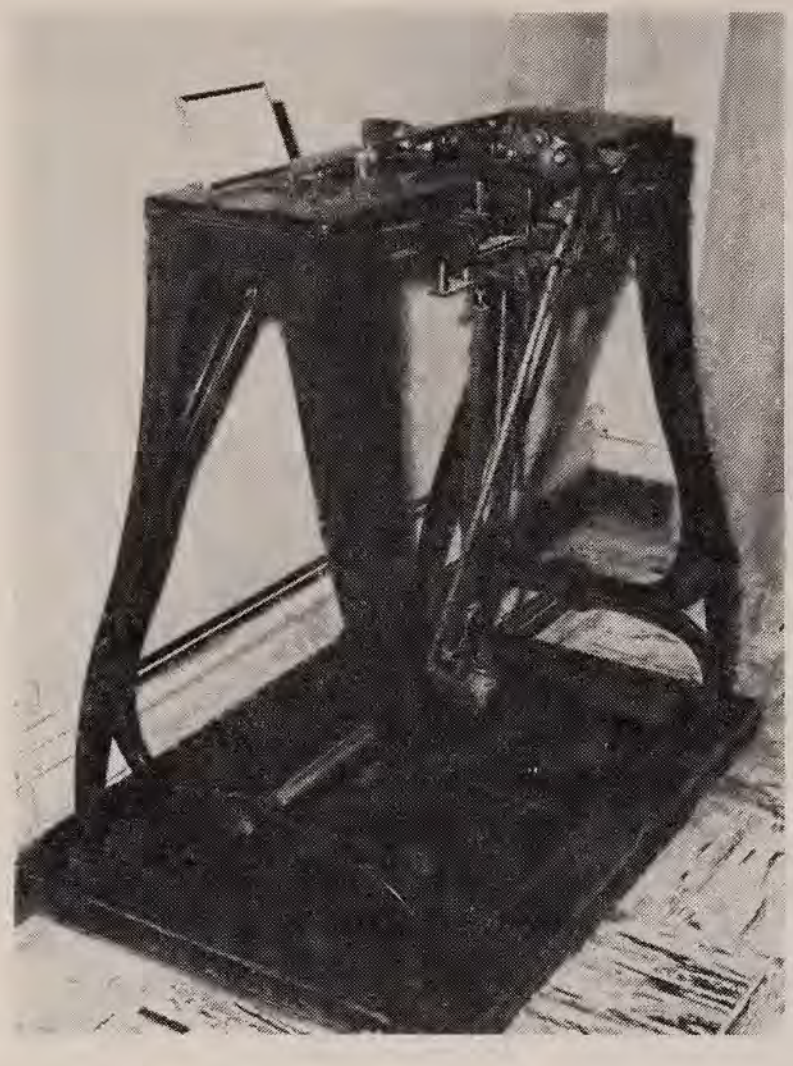
The Hall stereotyper was first exhibited at the Chicago World's Fair where workers with the blind saw its great possibilities. Superintendent John T. Sibley of the Missouri School for the Blind, who secured the second stereotyper that was made, expressed the general feeling when he wrote:

45. Rodenberg, *op. cit.*, p. 10. See also *Jacksonville Journal*, Jan. 6, 1893, for an interview with Hall on the subject of the stereotype maker.

46. Hall, "The Story of an Invention," *loc. cit.*, p. 72-73. See HLB No. 2, July, Aug., Sept., *passim*, for details.

47. Hall to Mrs. M. W. Sawyer of Dorchester, Mass., Aug. 31, 1892, HLB No. 2.

48. Hall to J. W. Smith, Nov. 14, 1892, HLB No. 2.



After nearly a year's work with the stereotyper, I am led to believe that, as far as the education of the blind is concerned, this invention is the most important of the century, if we except the invention of the point system by Louis Braille. These two form the immovable pillars upon which the future education of blind must rest. When the value of both is well understood by all, printing embossed matter will be carried on so rapidly and so economically that libraries will grow and flourish like vegetation under a tropical sun.[49]

John Sibley's prophecy has come true. Today, in 1968, most books for the blind are printed from plates made on stereotypers following the principles of Hall's machine, although much improved and motorized. The process, however, has become automated, and the stereotyper is activated by a set of punched cards carrying the braille symbols, complete instructions for abbreviations, page numbers, margins, and so on. The cards are made by a magnetic tape to which the information is fed electronically by an earlier set of cards punched by an operator. But the end result is still an embossed plate from which the page of the book is printed.[50] For simple copying of books and other material in braille for use in schools for the blind, an electronic machine using plastic sheets has come into wide use.

While Hall was driving hard to get the braille writer into production, and at the same time was heavily engaged in experiments with his stereotyper, he was shocked to receive a telegram, followed by a letter, from J. W. Smith in Boston, informing him that Thomas C. Orndorff of Worcester, Massachusetts, had patented a braille writer and claimed that Hall's machine was an infringement. Hall immediately wrote to a firm of patent lawyers in New York to look into the matter. He was especially concerned that there might be some interference with his project

49. John T. Sibley, "Stereotyping for Embossed Printing," in *The Mentor,* v. 3 (1893), p. 9, 386.

50. From information provided me by Marjorie S. Hooper, editor of the American Printing House for the Blind, July 20, 1967. In the tradition of not making a profit from appliances for the blind, the International Business Machines Corporation made no charge for this installation, and will maintain it free for five years.

to make stereotypes on the writer, and he directed the lawyers to make for him a **caveat** (a legal claim), to having done this first.[51] Hall was relieved when he heard from his lawyers that it was their opinion that there was no reason why Hall might not patent his machine, "although it is for the same purpose and intended to do the same work" as Orndorff's machine.[52]

In the meantime Hall had done some investigating on his own. He had been advised, by whom he did not say, that in the first place, the Orndorff patent was not valid because it was based on combination claims, which, said Hall, "if I am not greatly mistaken were included in the E. J. Nolan patent No. 422614 . . . which had all the combinations claimed by Orndorff and much more." Hall said that the Nolan machine was operated by electricity, and that the embosser had punches arranged in two rows of three each, which were activated by a key or lever for each stylus, and "many more keys." There was a space key in combination with the carriage and step by step feed mechanism. But, as Hall pointed out, only one key was operated at a time, and each key controlled a different combination of dots. The machine, therefore, was much like a typewriter. Hall declared that "this Nolan machine [was] only one of many that have been constructed for writing Braille. The U.S. Stenograph Co. has a machine that has many of the features of the Orndorff and all other Braille writing machines."[53]

Hall also received a letter from Orndorff who, much to Hall's surprise, said that he had not seen Hall's machine, and he asked Hall for information. Hall told him that he was going ahead with the manufacture of his machines, and that he was prepared to defend himself against the charge of infringement. In fact, said Hall, he had himself made an application for a patent for two reasons:

> 1st. I am willing to give the blind of the world all there is in it. The machine will be sold at cost. This was so stated before we knew of your machine and before the date of the issue of your letters patent. . . . 2d. It was our belief from the first that the main features of the machine are unpatentable or if patented would not be worth the paper upon which it is printed, from the fact that the same devices and combinations were used for the same purpose years ago. The superior excellence of my machine is in the fact that the arrangement of the parts and general construction of the machine are such that there is no lost motion and a minimum of power is wasted to overcome friction.[54]

51. Hall to Munn and Co., Sept. 14, 1892, HLB No. 2.

52. Hall to Harrison and Seifried, Sept. 23, 1892, HLB No. 2.

53. Hall to Munn and Co., Sept. 23, 1892, HLB No. 2. It is a good guess that Hall's informant was J. W. Smith, who as editor of *The Mentor* was in touch with what was being done to provide appliances for the blind. Smith wrote frequently and freely to Hall. See HLB No. 2, *passim*.

54. Hall to Thomas C. Orndorff of Worcester, Mass., Oct. 5, 1892, HLB No. 2.

Nothing further was heard from Orndorff, and although in the end Hall did not patent his machine, he did have the phrase "Patent Applied For" placed on the first lot of machines manufactured by Harrison and Seifried.

As Hall reflected on the whole matter, he suspected that the Orndorff charge of infringement was a plot by Wait and the New York Point advocates, aided by the Remington Typewriter interests, and he asked his friend Smith to "keep both eyes open for anything that may occur in which the firm [of Wait, Orndorff, Remington and Co.] is interested.[55] Hall's suspicions were groundless, but because he had been so annoyed by the advocates of New York Point, he happily assisted in one more defense of braille as the best notation for the blind.

Because his writer and stereotyper operated so efficiently, they provided a strong argument for retaining braille as the written language of the blind, both in the United States and throughout the world. In 1909, however, there was an effort to establish New York Point as the standard for the New York City classes for the blind. Advocates of braille understood that the decision of so large an educational unit would strongly influence the rest of the United States. Although by this time Hall had long been out of active work with the blind, he joined forces with John Curtis, the head of education for the blind in the Chicago public schools, and George W. Jones, the superintendent of the Illinois Institution for the Education of the Blind, and William Jewell, the printer, in presenting the case for braille before the school authorities of New York. Two formal meetings were held in April and May, 1909, and Hall testified at both, speaking at length, and explaining why he had re-introduced braille at the Illinois school, and why he had made his writing and printing machines to use that notation. Curtis, Jones and Jewell spoke about the ease with which students learned braille, and pointed out that there were a large number of books and thousands of pieces of music available. They emphasized that because the Hall stereotyper was so simple to operate, reading material and music could be produced cheaply, and finally, that Hall's machines were in use in such large schools as those of Illinois, Massachusetts, Pennsylvania, and Missouri and in the public schools of Chicago.

The New York Point advocates fought back savagely, even accusing Hall of favoring braille because he would profit if his machines were used. Hall indignantly denied that he had profited personally, and explained that he had no patent on the machines, and that he had not tried to patent them because his only interest was in helping the blind. The upshot was that New York City adopted braille

55. Hall to Smith, Oct. 18, 1892, HLB No. 2.

for its blind children. Frank Hall, his braille writer, and his stereotyper "had stemmed the tide of New York Point, and by supporting the braille principle, opened the way to its universal victory."[56]

Hall resigned from his post as head of the Illinois Institution for the Education of the Blind in 1893 when the Democrats took control of the state government, and went back into public school work, serving as superintendent of schools in Waukegan. In 1897, however, with the return of the Republicans to power, Hall was reappointed head of the school for the blind and he remained until 1902.

He was widely known among educators, both the teachers of the blind and of normal children. His writer and stereotyper had won favorable attention among his colleagues, and he took a leading part at the Congress of Educators of the Blind at the Columbian Exposition in Chicago in 1893.[57] He was also a frequent attendant and speaker at conferences of teachers.

The gist of his talks on these occasions was, first, that the blind should be given as many experiences as possible to fit them to live in a world of sighted people, and second, that the teachers of normal children could learn much by studying the problems of teaching the blind. Hall said that the blind child, because of his limited ability to receive impressions, developed his imaginative powers and his capacity for drawing conclusions from his limited perceptions. Sighted children, he said, did not develop their powers of apperception because they depended so largely upon their much greater sensory perceptions. His conclusion was that teachers of blind children should give them as many sensory experiences as possible, and the teachers of sighted children should encourage them to draw as much as possible from their sensory experiences.[58]

During Hall's second term, two deaf-blind children were in school — Jessie Stewart and Emma Kubicek — both having lost their sight and hearing as the result of cerebro-meningitis, the former at the age of ten months, and the latter at three years. Both were given the same kind of training that Laura Bridgman and Helen Keller had received, being put under the personal care of Mrs. Helen Jordan, the kindergarten teacher at the schools. Hall was much interested in their cases because he had just completed a thoughtful study of the subject: "The Comparison of

56. Rodenberg, *op. cit.*, p. 10. The testimony of Hall and others before the New York City Board of Education committee is printed at length in "Which Tactile Print for New York City?" in *Outlook for the Blind*, v. 3 (1909), p. 24-46, 64-74.

57. *The Mentor*, v. 3 (1893), p. 39, 68-73, 160, 240, 243-51, 280, 319-20, 360, 385-89, 403-04, HLB No. 2, *passim*.

58. See, for example, Frank H. Hall, "Pedagogical Lessons from a Study of the Blind," in National Education Association, *Proceedings* (1898), p. 1033-38; Frank H. Hall, "Thoughts Suggested by a Study of the Mental Development of the Blind," in Illinois Society for Child Study, *Transactions*, v. 1 (1894), p. 31-39.

the Blind, the Deaf, the Deaf-Blind, and those Possessed of all their Faculties, in Respect to Imaginative Power." His conclusion that it was most difficult to educate the deaf-blind child was borne out by the cases of Jessie and Emma. Little could be done for Jessie, but Emma learned quite readily, and was called the "second Helen Keller." Hall explained the difference as being in part due to the fact that Jessie lost her sensory powers at such an early age that she had no usable memory of anything seen or heard.[59]

Hall's firm conviction that the blind should participate just as much as possible in the activities of the seeing brought him, in 1900, when the city of Chicago was considering the establishment of a boarding school for the blind, to convince the school authorities that it would be much better to have day classes in the public schools, rather than to isolate the blind children in an institution. On Hall's recommendation, one of his teachers, John B. Curtis, was appointed to pioneer in setting up public day classes. Within ten years, five other cities had followed the Chicago plan. One of Hall's contemporaries, Edward E. Allen, said that Hall's leadership in this matter was even more significant for the education of the blind than the invention of the braille writer.[60]

In 1902 Hall left the Illinois school for the blind because he did not approve of the practice of making positions in state institutions a matter of political patronage. He accepted a position as superintendent of the Farmers' Institute of Illinois, and for the rest of his life he devoted his attention to agricultural education, a matter in which he had been interested since his days at the Sugar Grove Industrial School. He owned a farm in partnership with his son, and sold dairy products in the city of Aurora.[61] His position with the Farmers' Institute called for him to organize meetings among farmers all over the state at which recent developments in farming were taught.[62]

Hall was a great success at his job. He had an easy, informal manner of speaking, yet impressed his hearers as a man of learning. He was a good administrator and could be forthright in expressing a viewpoint without being belligerent or dogmatic.[63] The men with whom he worked recognized his sincerity and his concern for the improvement of agriculture, not only for the dollars-and-

59. Illinois Society for Child Study, *Transactions,* v. 4 (1899), p. 18-30; Trustees of the Illinois Institution for the Education of the Blind, *Twenty-seventh Biennial Report* (1902), p. 16-20. See also *Jacksonville Journal,* Mar. 14, 1907, for an account of Emma Kubicek's life. The girl died in 1907 from diphtheria, aged 11 years.

60. "Frank H. Hall," *loc. cit.,* p. 57; John B. Curtis, "Frank H. Hall," *loc. cit.,* p. 5.

61. *Frank H. Hall,* a brochure, p. 28.

62. *Ibid.,* p. 60-62; Illinois Farmers' Institute, *Annual Report* (1903), p. 275; (1904), p. 18-25, 33-38; (1909), p. 263ff.

63. See Hall's reports and remarks to the board of directors in the annual reports of the Farmers' Institute.

cents that would flow into the farmer's pocket, but also because the daily life of the farmer's family would be richer.

He was an indefatigable worker, and rather than drop some of his responsibilities as he grew older, he added to them. He served as official state delegate to the Farmers' National Congress in 1908, and he was a member of the National Conservation Commission.[64] He also continued to visit more and more local institutes each year, and in the days before rapid transportation, this was exhausting. Although he remained physically strong, and was accustomed to horse and buggy traveling in all kinds of weather, one experience in the winter of 1909, when he had driven through a snowstorm and then waited several hours in a cold railroad station, was too much for him, and he contracted a respiratory infection. To this he paid little attention, although he was left with a bad cough, and he continued his winter's work. Finally, in the spring of 1910 he had to give up. The doctors declared that he had tuberculosis of the lungs and diabetes. He died from these diseases on January 3, 1911.[65]

Frank Haven Hall is well-remembered. Soon after his death a bronze bust was placed in the Aurora Public Library, and a collection of Hall memorabilia is there. His children published a widely circulated memorial brochure. In Jacksonville, at the Illinois Braille and Sight Saving School, he is represented in the historical museum established by the Alumni Association. It includes an exhibit of his writing machine and stereotyper, and there is a collection of historical materials concerning him and his inventions. A memorial marker was placed on the grounds in 1968 during the Diamond Jubilee of the invention of the Hall machines.

And, finally, Frank Hall lives on in the hearts of many people, some who see and some who do not; some who knew him personally, and many more who know him through the continuing influence of his good works.

64. *Frank H. Hall*, a brochure, p. 31.
65. *Ibid.*, p. 68.

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 Hendrickson, Walter B.

FRANK H. HALL AND HIS BRIALLE WRITER.
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