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A Dramaturgical Analysis of The Miracle Worker

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A DRAMATURGICAL ANALYSIS FOR

THE MIRACLE WORKER

by

ABBY BUTZER

A THESIS SUBMITTED

IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE

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A Dramaturgical Analysis for *The Miracle Worker*

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This thesis has been examined and approved by the following members of the student's committee.

Heather Hamilton, Advisor

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ABSTRACT

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This document is a thesis submitted in partial fulfillment of the Master of Arts degree in theatre. It is a dramaturgical analysis for William Gibson's play *The Miracle Worker*, providing a reference for directors and actors. The thesis explores the play's medical and pedagogical history in six chapters: the physiology and psychology of language acquisition as it pertains to sight and/or hearing impaired children, a pedagogical comparison of Samuel G. Howe and Annie Sullivan, a modern diagnosis of the fever that destroyed Helen Keller's vision and hearing, the 19th century pathology and treatment options for the disease of the eye that troubled Annie Sullivan for most of her life and the pathology and prognosis for tuberculosis of the hip, the infection that killed Sullivan's brother. A works cited is included.

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PREFACE

A study of the pathology and history of the medical components in *The Miracle Worker* began when I heard a broadcast on Minnesota Public Radio, explaining the research that shows how the acquisition of language in young children separates them from other animals by allowing the brain to connect unrelated concepts. The words do the work of unlocking the brain. They begin to think as a human being. Annie Sullivan had an instinctive understanding of this science, and her passionate dedication to reaching Helen Keller through words is an illustration of the most up-to-date theories of language specialists who work with children.

Further studies into the medical history of William Gibson's play were inspired by my finding a medical text book on diseases of the human body in the basement of my father's house. The book, published in the mid 1800s, had originally belonged to my great-grandfather John Rock, a veterinarian from Pound, Wisconsin. My father inherited the book from my grandfather, John Butzer, a family physician, who used it for reference in his own practice. Grandpa John told Dad that in the 1800s, there were few text books written for the study of veterinarian surgery and medicine, and animal doctors would study medical books written for M.D.s, gleaning what they could and inferring what they needed to in order to translate treatment recommendations to their animal practices.

That early medical text book, with presumably the most up-to-date information when it was published, may as well be a book of witchcraft and spells. What doctors understood about infectious diseases at the time of Helen Keller's illness was next to nothing. They tried very, very hard to save the lives of children with whatever rudimentary knowledge, ancient tools and simple medicines they did have. But they were guessing at the cause and treatment of virtually any illness that caused a fever. It's both fascinating and touching to read, in these older text books, the earnest instructions for intensive hands-on treatments that doctors personally administered in the home of the patient, attending them for hours, days; sometimes weeks, seeing them through a crisis, or acting as a helpless witness to a family's tragedy.

In the mid to late 1800s, treatments and surgeries used for the infectious eye disease that blinded Annie Sullivan were rudimentary at best. Reading about the early surgical techniques used to mitigate her sight problems associated with trachoma is enough to make anyone cringe. Similarly, tuberculosis of the hip was very common in children of impoverished households, excruciatingly painful and impossible to treat successfully. The prognosis was virtually always unfavorable.

Directors, actors and other production staff working their way through *The Miracle Worker* may find this document helpful. Knowing, for example, how the doctor might have treated the feverish and suffering baby Helen offers perspective to those in the roles of Kate and Captain Keller, and the family's doctor. The background historical science helps quantify their relief at her survival and apparent robust recovery. The

actress playing Sullivan is offered a glimpse of what happened in the days before her arrival at Ivy Green: traveling hundreds of miles of hot dusty slow train travel, days after a painful operation (one of many); with no pain medication or infection preventing antibiotics.

Most dramaturgical protocols explain and contextualize a broad catalog of elements of a script. This document, in contrast, is a dramaturgical analysis with a very narrow linguistic, pedagogical and medical focus. The objective is to create a visceral historical back story for the life and times of these two incredible women, and to give a production team a better understanding of the significance of their accomplishments.

CHAPTER I

PHANTOM

“There’s only one way out for you, and it’s language.”—The Miracle Worker, Act III

Any actress playing Helen Keller in Gibson’s *The Miracle Worker* is actually portraying a different character, right up until the triumphant climax of the play. Helen Keller gave this character the name “Phantom.” When discussing her childhood up to the time before Annie Sullivan’s arrival, Keller referred to herself as Phantom, and wrote about this entity in third person; completely separate from the human child she would become with Sullivan’s help. In her writings, she described a vaporous Phantom, living in a “no world,” with no concept of time, space, relationships, understanding, and no way to connect any of the things she did recognize (Keller, Teacher 42).

Keller was born with a promising intellect and imagination. She was saying “how d’ye” at six months and waving. At that age, according to studies of infants and language, she would have clearly identified and begun imitating the distinct drawl associated with her rural Alabama home (Angier). Keller also said “tea,” and “water,” and understood the words. She said, “Everything that I saw others do, I insisted upon imitating” (Keller, The Story of my Life 25). She walked at a year. But the fever that damaged her brain at nineteen months erased light and sound, and within a few months she had forgotten the bits of language she had learned, except for the word water,

which she remembered and repeated long after her illness; although her pronunciation of the word would become less and less intelligible as time went on. And because she had no visual or auditory contact with her family, she lost all of the essential bonds to humanity. “The sweetness of childhood created by friendly voices and the light of smiling faces was dormant in her,” said Keller, referring to Phantom (Keller, Teacher 37).

The child that was Helen Keller without sight and sound devolved from a communicative, highly engaged child into something sub-human, often angry, with no sense of right or wrong, or emotion. Because she had no words, there was no way to delineate between objects, feelings, actions, or matters of conscience. She could feel the surface of a table, but with no label for it, it was nothing to her, it had no meaning in her mind. Referring to Phantom in third person, Keller said, “I remember tears rolling down her cheeks but not the grief. There were no words for that emotion, or any other, and consequently, they did not register” (42).

She acted on animal impulse. “It was all want, undirected want; the seed of all the wants of mankind that finds their fulfillment in such a multitude of concrete ways” (42). To that end, she developed simple signs to satisfy physical needs and desires: something to drink, her mother, her father, cake. She was using over 60 signs of her own creation when Sullivan met her. But few could understand her signs, and this often sent her into fits of frustrated fury. She was also confounded by the realization that others seemed able to communicate by using their mouths. She’d stand with her hands touching the mouths; fingers sometimes in the mouths of the speakers. She tried to

copy their movements, gestured frantically, and then exhausted herself kicking and thrashing when she could not make her desires understood.

Physical aggression was a predictable outcome of her frustrated and confused intelligence; such outbursts are a common behavioral problem for maturing deaf and blind children (Hermann 11). As she got older, the feeling of frustration grew stronger, she felt the signs she used were becoming less and less adequate; she could not make herself understood. She kicked, punched, clawed, scratched, pulled hair, pinched and, in other ways, beat her world in an attempt to set herself free from “the invisible hands” that were holding her. Keller recalled Phantom’s frequent outbursts, not because she remembers the emotion behind the battle, but because of the tactile memory of the combat with whatever enemy caused the anger. At six years, Phantom was unmanageable. She was a strong, sturdy thing that had become a danger to herself and the others in the household. But perhaps more importantly, she was also becoming more despondent, crying often and to the point of exhaustion, seeking comfort from her mother, “too miserable to even remember the cause of the tempest” (Keller, The Story of My Life 17). Keller remembers that her desire to be able to communicate had become so intense that these outbursts happened hourly. She said, “Anger and bitterness had preyed upon me continuously for weeks and a deep languor had succeeded this passionate struggle” (21).

Kate Keller’s desperation to help her daughter lead to numerous trips to specialists in the South, and finally to Baltimore to see a famous oculist who specialized

in “hopeless cases” (Herman 23). His prognosis concurred with the rest: she would never see or hear again. But he suggested that she could be taught, and he knew that Alexander Graham Bell, a close distance away in Washington, was doing good work with deaf children, and Bell might be able to suggest a school or a teacher for Helen. Bell’s meeting with Helen would lead the Kellers to the Perkins Institute and Annie Sullivan. According to Bell’s biographer Robert Bruce, Bell’s first impression of Helen was that her well-formed face was “chillingly empty,” void of expression or reflection of personality (400). Similarly, three days after her arrival in Tuscumbia, Sullivan wrote a letter to a friend and described a child with an intelligent face, but lacking “mobility, or soul, or something.” The girl rarely smiled, was quick-tempered and strong-willed, and impatiently rejected caresses from anyone other than her mother.

Observations of Keller’s soul-less countenance, and Keller’s own recollections of the non-human Phantom in her no-world before her soul-dawn, as she referred to it, and the relatively rapid transformation of her intellect and personality after her epiphany at the well-pump, are consistent with contemporary scientific findings that link human development to the acquisition of language. For centuries, scientists and psychologists have studied and researched to answer the question: how does language, or the absence of it, effect the human experience? Research explains the motivation behind Phantom’s behavior up to the moment of Keller’s liberation and rebirth at the well-pump, and validates Sullivan’s nearly obsessive desire to actualize the person of Helen Keller with language. Sullivan’s single-minded goal in those early days of contact

with Helen was to teach her that everything had a name. She had carefully studied all of the accounts of Samuel G. Howe, the founder of Perkins Institute, and his philosophies of teaching language to the blind and deaf, including these words: “Language is to the mind more even than the right hand is to the body . . . more than light to the eye” (Braddy 115). It was her keen understanding of this principle that motivated Sullivan’s near frantic effort to reach into Helen’s conscious. Keller called the pre-Sullivan period of her life a “mental drought”; the consequences of the illness she would resent as a “purposeless evil” for the rest of her life. This drought could be compared to the experiences of other children through history who were cut off, through abuse or accident, from language or normal human contact: she did not develop as a normal child would. She gives sole credit to Sullivan, intervening at that critical moment in her development, for the restoration of her humanity (Keller, Teacher 41). Her teacher’s untrained, instinctive pedagogy was ahead of its time.

Noted neuropsychologist and author Paul Broks, in his book, Into the Silent Land: Travels Into Neuropsychology, examines the ideas of personality and soul, and suggests that at the center of both is language. He asserts that all a person is in the end is a story; the story they tell themselves about what happened to that body over time. There is no way to delineate between past and future without language (51). Helen didn’t know who she was; her personality was unrealized. Her expressionless face reflected the absence of her story.

Charles Fernyhough, psychologist, in his book A Thousand Days of Wonder, observed his daughter's development from birth to three years. He writes that life with a pre-linguistic child is a little like watching a silent movie. Adults must interpret the actions of the child to determine the thoughts of the child. When children begin to talk, they not only have a way to name things, they have a way to "channel thoughts into a medium through which they can be communicated" (89). When language kicks in, it's like watching that silent film and suddenly there is an accompanying sound track. Science ponders whether children find words for thoughts that were already there, or if the language initiates the thoughts. Does language translate thought or create it?

Dr. Elizabeth Spelke and psychologist Susan Hesplos of Harvard University tested this question with pre-language five month olds and non-English speaking Korean children using a technique called dishabituation. If someone is exposed to one sound for a long period of time, like the sound of a vacuum cleaner, over time they don't notice the sound anymore. But if the sound changes; say something gets stuck in the vacuum and it makes a new noise, they start responding to it again. In Spelke and Hesplos' study, the five month olds, without words for the subject, were able to dishabituate; they were sensitive to differences to two similar test stimuli as well as the Korean children with words. From this study, Spelke and Hesplos hypothesized that infants are able to think about a broad range of subtly different ideas and have sophisticated building blocks of thought and understanding ("Words That Change the World").

Clearly, Keller was demonstrating an innate intelligence before language and she was processing simple thoughts; determining what she wanted, struggling with making herself understood. Psychologists agree that thought comes before language; to refute that would suggest that mutes and aphasics are mentally incapacitated, a theory embraced for centuries. But the running stream of consciousness that is adult thought is made up of language. The thoughts are made up of words. Keller, at six years old, was thinking at the level of a pre-language infant: mute, biological; animalistic.

In fact, studies show that the similarities between the thoughts of certain animals and pre-language children are striking. In side by side tests, the two groups perform almost identically. In a recent Harvard study, conducted by Dr. Elizabeth Spelke and her colleague Linda Vermer-Vazquez, rats could not perform tasks that involved connecting unrelated cognitive concepts, and neither could toddlers. For example, rats could navigate their way through a maze by way of shape, but not color. Similarly, eighteen-month-olds in the study used geometric clues to locate hidden objects, navigate through rooms and orient themselves in a three dimensional space. But they couldn't connect the geometry with concepts of landmarks or décor (Angier). The children couldn't do it at two years, or three years, or four years, or five. But at six, something happened in the brain that allowed them to accomplish these tasks. And what happened was that they had developed language skills similar to adults. Spelke explains that it's not that children as young as two, three and four aren't talking, it's that they're not using what Spelke calls spatial language to talk about what they're doing.

What allows children to start making those more complex connections in the brain is the words. One day around the age of six, a child will start using connective phrases like “it was to the right of the yellow clock,” and inside the brain, the language connects the three concepts (spatial relation, color, object) and the six-year-old gets it. The understanding comes with the use of the words. When that happens, the child begins to think, and leaves the rat behind. Spelke talks about it in terms of islands. Inside the brains of infants are islands of thought. In one corner of the brain is an island for spatial information; in another corner is one for actions, another for objects, and another for numerical relationships. Young children have language to identify those concepts; the words are there, but they are not connected until the day the child connects them with language. Spelke adds that while everyone knows that language is the best way to connect and engage with others, it also allows humans to connect different systems in a single mind. She’s careful to clarify that it’s not the brain getting bigger that allows the connections to be made; it’s the power of the words themselves (“Words That Change the World”).

Children with normal language development have a fairly advanced self story by the age of three. Through their running stream of dialogues, monologues and soliloquys, they reveal themselves. They are not only able to tell about past events, but by talking with adults about the past, they are also able to project themselves into the future. To be able to do that, they must be able to use tools linguists call cohesive devices; words like *next*, *then* and *after*, and complex connectives like *if*, *so*, *but* and

then. As children develop language skills, their sense of self solidifies. They are able to think about themselves in relation to their world. When language combines with mute animal intelligence, something extraordinary happens. “Whatever thinking children are doing before language is disconnected biological thinking. Language puts it all together” (Ferryhough 105). The story begins. I think, therefore I am.

Consider Keller’s reaction to that moment of language realization at the well pump. She said, “Phantom understood the meaning of the word, and her mind began to flutter tiny wings of flame . . . spark after spark of meaning flew into her mind until her heart was warmed and affection was born” (Keller, Teacher 40). She later remarked that at that moment, she felt abstract emotions she had never felt before: guilt, sadness, sorrow. All of them came at once. In the minutes just prior to coming to the well pump with Sullivan, Keller had smashed a doll in a moment of impatience as Sullivan persisted in trying to teach her the difference between “w-a-t-e-r” and “m-u-g.” After her sudden acquisition of language, Keller went back into the house, picked up the doll and cried. She said “I realized what I had done, and for the first time I felt repentance and sorrow” (Keller, The Story of My Life 24). But she also felt real joy at what she called her “soul’s sudden awakening” (25). As she lay in bed that night, for the first time that she could remember she looked forward to a new day.

Keller’s observation that the acquisition of language to her meant the birth of her soul is consistent with stories through history of other phantoms; those with a

language deficit who later experienced a soul dawn. The common threads between Keller and these other phantoms are striking.

In his book, The Wild Boy of Aveyron, Harlan Lane writes about the interaction between the 18th century grammarian Abbé Sicard and his deaf-mute student Jean Massieu. Born in Simons, France, with five deaf-mute siblings, Massieu received no education until he was thirteen years old (89). “I was in the dark . . . I was like the animals.” Like Keller, Massieu used manual gestures of his own invention to express ideas; family and friends understood him fairly well, but also like Keller, he was frustrated and wanted to learn how to express himself as he saw others doing. He begged his father for permission to go to school, but his father refused, signing to him that he could never learn because he was a deaf-mute. His father’s dismissal left him in deep despair. Again, he went to his father, this time with his fingers stuck in his ears, and gestured for him to unplug his ears so he could hear. His father answered that there was nothing to be done. When he was twelve, he went to school without permission, and asked the teacher to be admitted to the class, but was refused and sent away with a stern warning to stay away.

Eventually, he met a man who initiated contact with Sicard, who agreed to take charge of Massieu’s education. Sicard’s first objective was to teach the boy that strings of letters, which Massieu had previously learned, represented objects. He was confused and frustrated at first, but within a matter of weeks, he made the connection. Massieu was overjoyed. He immediately began pointing at everything around him, demanding to

know their names. Within four years, he was as capable “as people who hear and speak,” Massieu said (90). Sicard observed that, as a result of learning language, Massieu became “a new being” (Schaller 12). Massieu would grow up to become a pioneer in the education of the deaf, working for the National Institute for the Deaf in Paris.

A more dramatic story of language discovery comes out of Los Angeles, California in the late 1970s. On her first day at work, Susan Schaller, a twenty-four-year-old graduate student working as a sign language interpreter in a reading class for the deaf, noticed a man standing in the back of the room with his arms folded. He was watching, but not participating in the class. The 27-year-old was a native of rural Mexico and had been raised entirely without language (Schaller 30). Born deaf, he not only had not been taught language, he had no idea that there even *was* language. He could see people communicating with their mouths moving, and he could see people responding, but, as he later recalled, he didn’t know people could hear; he thought they had figured out this system of connecting to one another on their own, and that he “must be stupid” (“A World Without Words”).

Schaller went up to the man, whom she calls “Ildefonso,” and signed “Hello, my name is Susan.” He immediately signed back, “Hello, my name is Susan.” She answered, “No, no. I’m Susan.” And he responded, “No, no. I’m Susan.” Each time they met, he did what Schaller called “visual echolalia,” mimicking, but with no understanding; exactly as Keller did during her first weeks under the Sullivan’s tutelage

(Schaller 32). Schaller observed that he appeared to be bright. He was curious and interested. He didn't lack intelligence; he was simply missing the language piece (36).

For many weeks, Schaller met one on one with Ildefonso, sitting across from him at a table, attempting to teach him language. But he simply could not make the connection. He would repeat everything she signed, but the signs had no meaning to him. If she made the sign for "book," which looks like someone opening a book, and then show him a book, Ildefonso would obediently open the book. He thought Schaller was ordering him to do something. If she made the sign for standing up, and then demonstrated the action, he would stand up. Over time, both Schaller and her student grew frustrated; but mostly, after all this time of signing and copying signs, he just seemed to be getting bored. She was surprised to see him come back to class week after week. At some point, Schaller remembers wondering if maybe he was too old to be taught language. Maybe there was a window of time, and it had closed (42).

Then, Schaller got an idea. She decided to ignore Ildefonso. She still sat across from the table from him, but she faced away from him, pretending to talk to an invisible student, who sat across from her in an empty chair. She signed the word for cat. She drew a cat. She pretended to pet the cat; pointed to the cat, signed the word cat. Then, she jumped across to the empty chair and pretended to be the student. The "student" suddenly got it. Schaller mimed coming to the realization that the sign for cat was the cat on the board. And not just the chalk cat on the board, but all cats. Cats that you could pet, and cats that cleaned themselves by licking their paws. The imaginary

student figured it out. All this time, she could see Ildefonso in her peripheral vision, watching her with some kind of interest, but still not getting it. She left that day feeling hopeless and exhausted and sure that he would not return to class again.

But the next day he was there again, watching as she started to teach to the invisible student. Schaller remembers that she began the same lesson as the day before, signing cat, and drawing a cat; miming the invisible student's reaction. And then she stopped mid-motion. Out of the corner of her eye, she noticed Ildefonso had suddenly sat up very straight. He was frozen. "The whites of his eyes expanded as if in terror. He looked like a wild horse pulling back, testing every muscle before making a powerful lunge over a canyon's edge" (44).

He had made the same connection Keller made at the well pump. "Oh, everything had a name!" And in an almost identical reaction as Keller at the well pump, he began to look wildly around the room at every object. He slammed his two palms loudly down on the top of the table and demanded to know the name for it. He pointed to the clock, to the chair, the door, while Schaller quickly signed answers to his questions. Then he suddenly turned pale, collapsed and wept. "Folding his arms like a cradle on the table, he lay down his head" (44). For twenty-seven years he had been isolated from the world, and in those moments he realized what he had missed.

After that initial discovery, the real work of teaching Ildefonso language began. It amounted to plodding, frustrating, discouraging hours of repeating the simplest words for weeks at a time. Ildefonso was a baby in terms of language, and like Sullivan to

Keller, Schaller taught her student using baby talk. When Helen Keller began learning language, her experiences in the world were limited, and she was often learning about the thing she touched as she learned the word, as a baby does. Ildefonso, in contrast, had twenty-seven years of experience. When he learned a new word, it would trigger a story or a memory, and the simple one or two word sentences he knew were not adequate to ask or answer questions. Progress was agonizingly slow (69).

Schaller often wondered if it would even be possible to teach Ildefonso language after twenty-seven years without it. The task seemed insurmountable and she wasn't sure if she was experienced or capable enough. What kept her going, she said, was an increasing visible light in Ildefonso's eyes. He appeared to be waking up more each day, more alert, more aware of the world. A soul dawn.

Schaller asserts that before language, Ildefonso was essentially aboriginal. He had no tools or symbols for abstract thinking. Like Keller, he could only manipulate thoughts about concrete objects. Regardless, Schaller maintained that he *was* human. His ability to communicate reminded her of a "mimicking chimpanzee," and the level of expression was little more than a cat or a dog, but he was aware of himself as a man, and had a human personality (106).

The idea that language is the center of the personality and soul, as Paul Broks asserts, is provocative. Helen Keller and these others all describe themselves before language as living in a dark time: animalistic, sub-human, stupid. Keller's perception of herself as a phantom living in a no-world is not unique. Before language, Helen Keller

she didn't exist. In his book A Man with a Shattered World: The History of a Brain Wound, A.R. Luria writes that it is hard to separate humanness from language. "Apart from being a means of communicating, language is fundamental to perception and memory, thinking and behavior. It organizes our inner life. What is distinctly human [is] the ability to use language" (Luria 33).

Annie Sullivan appeared in Helen Keller's life at a crucial moment in her development: at the age of six, precisely when scientists have determined that words cause an evolution in the brain to higher levels of thinking and a sense of self. Keller used the word "soul-less" to describe herself before Sullivan's arrival into her life, and credited Sullivan for transforming her from "Phantom" to Helen Keller through the acquisition of language.

CHAPTER II

LAURA BRIDGMAN

"We have a present for Helen, too! . . . And we took up a collection to buy it. And

Laura dressed it." – The Miracle Worker, Act I

Fifty years before Helen Keller lost her hearing and sight to a childhood illness, Laura Bridgman, at the age of two, lost her hearing, sight, smell and most of her sense of taste from a fever that nearly killed her. The similarities between Keller and Bridgman go beyond their illnesses and subsequent infirmities. Both exhibited sociological developmental retrograde in response to early childhoods without effective means to communicate; their experiences are almost identical. They were nearly the same age when they were removed from their parents' care to receive immersive education. And they shared a very similar reaction to their sudden revelation and acquisition of language. For several possible reasons, the similarities end there. Keller would grow up to be a college-educated author, philanthropist and exuberant world traveler; one of the most well-known women in the world's history. Bridgman would be largely forgotten and spend the rest of her life in the institute that taught her language. Regardless, Bridgman falling ill at the age of two set in motion the events that would result in the extraordinary partnership of Annie Sullivan and Helen Keller. American

Philosopher William James wrote, in 1903, “we cannot forget that there would never have been a Helen Keller if there had not been a Laura Bridgman” (Freeberg 217).

In early February 1832, Daniel and Harmony Bridgman, successful farmers whose homestead was in the Connecticut Valley town of Hanover, New Hampshire, buried two daughters, six-year-old Mary and four-year-old Frances Collina, after an illness that doctors diagnosed as a virulent form of scarlet fever, swept through the household. They very nearly lost a third (Freeberg 14; L. Richards 3). Their two-year-old daughter Laura survived, but barely. Bridgman later wrote that she was “attacked by horrible sores on my face, neck and back” (Freeberg 14). Harmony Bridgman remembered vividly, in a letter to Samuel Gridley Howe in 1841, how it began:

It was Tuesday morning about nine o'clock the 28th of January (her father was then gone for the doctor for Mary, who was taken sick Tuesday eve previous) she went to her Aunt Phebe [sic] as she was sweeping and said Pebe by by [sic] (meaning to have her take and rock her) she sais [sic] again Pebe by by, I told her I thought she was not well she took her and in a few moments she was a distressed little creature as you ever saw.
(Gitter 47)

In another letter to Howe, this one dated 1838, she remarked that at the time she was sure that every hour of Laura's illness would be her last. “The disease was evidently seated in the head, and her eyes became badly swollen and just closed together” (Freeberg 14). Ten days into the illness, a doctor examined Bridgman and told Harmony

Bridgman, “your child’s eyes are spoilt” (Gitter 46). Five weeks later, the Bridgmans realized that their daughter couldn’t hear. As time went on, they suspected that she had also lost her ability to taste and smell. For five months after the illness, she was kept in bed in a darkened room; any sort of light caused extreme pain to her eyes (Richards, L. 4). Bridgman said that sunshine streaming in through a window “made the tears flow from my eyes like a heavy shower. I dropped down my head into my little hands as the ray of the light stung my eye lids like the sharpest needle or a wasp” (Gitter 45). Weak and fragile, she was confined to bed for a year. It would be another year before she was finally able to be up all day and stand without support. Bridgman’s mother remembered that Laura’s eyes had been bright blue before her illness. Afterward, they shriveled and disappeared behind closed lids. Her left eye had been completely destroyed, but she was still able to detect some changes in light with her right eye until the day she stumbled and punctured the eye on the spindle of her mother’s spinning wheel around the age of five (Freeberg 14).

During the long convalescence following the fever, Harmony pulled her daughter from room to room in a chair, prepared special foods that she could swallow, and got up in the middle of the night to bathe the girl’s eyes in oil. It’s compelling to note that while she attended to Laura in this way, and continued the dozens of other household chores associated with running a 19th century home and farm, she was pregnant with the couple’s next child, Addison Daniel, born August 1832 (Gitter 47). In her book, Laura Bridgman, the Story of the Open Door, Laura Richards writes that Harmony ruled over

the farmhouse: “. . . she spun, wove, made and knitted all the clothes for her children and herself; here she churned, baked, cooked (over the great open fireplace), made soap and candles.” She also raised and tended lambs, bees, and poultry (1). Perhaps because of her mother’s incredibly demanding physical work load, Laura Bridgman was born small, and was a “puny, rickety” infant (L. Richards 3; Hall, Howe 31). She suffered from fits and seizures at intervals from the time she was about a year and half years old, and these seemed to retard her growth and development. At twenty months, her health took a turn for the better and she began to thrive. Like Helen Keller, her parents remember her as unusually intelligent before her illness (Lamson vii). She spoke in complete sentences, knew some of the letters of the alphabet and “was rather more forward in talking than the generality of children at that age,” according to her mother (Freeberg 12). It wasn’t long after her illness that Bridgman forgot the language she knew and any vocal sounds she made were random and essentially involuntary, like an animal reacting to stimuli. She spent many hours of the day following her mother around, constantly, maddeningly hanging onto her skirts, feeling her movements as Harmony went about her house work. In time she was able to accomplish simple household tasks without help: folding laundry, setting the table, sweeping, making beds, knitting and sewing; she held needle and thread to her mouth and used her tongue to help put the thread through the eye of the needle. One of her favorite things to do was sit in a rocking chair by the fireplace and feel the activity of her mother in the room. She had no toys, but carried around an old leather boot of her father’s, and ministered to it

as if it were a baby doll, rocking it, wrapping it in a blanket, cradling it in her arms. Up until the age of six, she was fairly easily directed and managed. Her family developed simple signs; a push meant go, a pull meant come, a rub of the top of the head or on the hand meant stop doing that (L. Richards 12). As she grew, she became more difficult to manage and disrupted the household. Howe wrote, "her mind and spirit were as cruelly cramped by her isolation as the foot of a Chinese girl is cramped by an iron shoe. Growth would go on; and without room to grow naturally, deformity must follow" (L. Richards 12). Once, in a fit of anger, Laura picked up the household cat and threw it into the fireplace. The cat survived and learned to steer clear of the girl. She began to ignore her mother's authority. More frequently, her father had to intervene and apply firm discipline to control her behavior. Firm discipline meant a heavy and hard hand. Laura remembers too, that when she disregarded her mother's instructions, her father would stamp his foot. She could feel the hard fall of the foot through vibrations in the floor and in this way she could be redirected. She recognized that Father had spoken and he must be obeyed.

Her mother recounted that at the age of seven, Laura seemed to be at a critical point in development (12). Their hope was that she would grow to be a docile, gentle woman, but with no way to communicate right and wrong, or reach Laura's moral sense, the Bridgman's were afraid they were losing all ability to control her will and she would become completely unmanageable. Resorting to physical punishment to control her behavior would only have a negative effect over time. Howe wrote that it was

difficult for any parent to maintain a balance of teaching a child discipline while not breaking the spirit. "It is easy to see," he wrote "that in the case of Laura, all these difficulties are greatly increased; and indeed that they never would have been overcome while she was limited in her communications with others to the narrow sign language of the sense of touch" (Howe, Hall 43). With a busy home and farm to manage, neither parent could devote time to giving her special attention.

The first link between Laura Bridgman and Helen Keller was James Barrett, a junior at Dartmouth College. In 1837, the selectmen of Hanover had no time to work on tax billings. Assessments were made in May, and the farmers who served as selectman were busy with planting and other spring work. They hired Barrett to help, and he did the work at the home of the Bridgman's because of its relative close proximity to the college (37). Barrett was moved and intrigued by Laura Bridgman, and often observed her as she went about doing her simple household chores, sitting by the fire, playing with her old boot, or attempting to play with the cat. He contacted Dr. Reuben Dimond Mussey, professor of surgery and anatomy at Dartmouth, and suggested that he examine the child. Mussey, also impressed, wrote an article about Laura for the publication Barnard's.

Samuel Howe read that article and was immediately interested in bringing Bridgman to his school for the blind so that he could conduct a language experiment with her. He wrote, "The first knowledge I had of Laura's existence was from reading an account of her case written by Dr. Mussey, then resident at Hanover. It struck me at

once that here as an opportunity of assisting an unfortunate child, and moreover, of deciding the question so often asked, whether a blind-mute could be taught to use an arbitrary language" (38).

Very soon after reading Mussey's account, Howe traveled from Boston to the Bridgman farm, observed Laura throughout the day, and asked permission to take her into his care for a time. Her parents agreed. In October 1837, Laura traveled with her parents to the Institution for the Blind, as Perkins was known then.

Howe and his sister Jeannette were waiting for Laura and her parents when they arrived. Laura remembers panicking when her parents made motions to leave and clung to them. Eventually she was pulled away, her hands forced open to release her grip, and her parents immediately departed for home. Laura burst into hysterical tears. Jeannette remembers trying to distract the screaming girl with treats her parents had packed for her in the travel trunk, but she was inconsolable (Gitter 78).

Laura remembers crying and suffering from horrible homesickness for an endless stretch of sorrowful days. Howe, however, reported that time differently. In a letter to Daniel Bridgman dated November 8, 1837, Howe wrote encouragingly that within two days she "became very lively and I do not think she repines for home at all now" (Howe, Hall 45).

Laura lived with Howe and his sister in their private quarters of the institute and spent virtually all of her time with them in those earliest days. Two weeks after her arrival, he began the lessons. In the Ninth Report of the Perkins Institution, Howe

detailed his first experiments. He took common-use items, “knives, forks, spoons, keys, etc., and pasting upon them labels with their names in raised letters” (49). Laura quickly distinguished that the different articles had different symbols attached to them. Then Howe used detached labels and asked Laura to set the label on top of the item. A pat on the head meant she had done it correctly, a bump on the elbow meant try again. “She very easily learned to place the proper labels upon them” (Richards, L. 24). After awhile, instead of labels, she was given individual raised letters of the alphabet, arranged in the correct order next to the object. She was shown the order and the object, and then the letters were mixed up and she was asked to rearrange them in the proper order again. It took two months of this slow, methodical work before Laura realized what Howe was teaching her; that everything she touched had a name (Gitter 83).

The following account of Howe’s, written three years after the events, echoes Dr. Elizabeth Spelke’s observations of children and their acquisition of language, and Helen Keller’s remembrance of the birth of her soul:

Hitherto the process had been mechanical, and the success about as great as teaching a very knowing dog a variety of tricks. The poor child sat in mute amazement; and patiently imitated everything her teacher did; but now the truth began to flash upon her—her intellect began to work—she perceived that here was a way by which she could herself make up a sign of anything that was in her own mind, and show it to another mind;

and at once her countenance lighted up with a human expression: it was no longer a dog, or parrot,—it was an immortal spirit, eagerly seizing upon a new link of union with other spirits! (L. Richards 25)

Howe wrote that he could nearly pinpoint the exact moment “when this truth dawned upon her mind and spread its light to her countenance” (25). He remembers that moment as the happiest of his life:

It sometimes occurred to me that she was like a person alone and helpless in a deep, dark, still pit, and I that I was letting down a cord and dangling it about, in hopes she might find it; and finally she would seize it by chance, and, clinging to it, be drawn up by it into the light of day and into human society. And it did so happen. (25)

Laura’s own recollection of that time is less dramatic. “I enjoyed my new lesson much more than I can say. I never felt weary of studying; as it was difficult for me to understand such simple and short words . . . Dr. H. was my first instructor. Miss Drew was my first instructress. I loved them so dearly for a great many excellent reasons” (28).

Once Laura made the connection to language, Howe taught her the finger alphabet (the same manual alphabet Sullivan used to teach Helen Keller from the onset), and Laura’s rate of absorption and demand for new words increased exponentially. The institute was obliged to let Miss Drew devote all of her time to Laura, and hired additional staff to help other children; Laura kept Drew busy constantly

identifying objects and spelling new words into her eager hand (28). Every day, her teacher remembers, her face seemed to be more alive and expressive, reflecting a growing understanding and awareness (Freeberg 38).

Howe's success with Bridgman made them both world famous after he published, in 1840, his report of the success of his experiment. In the years after Bridgman's language breakthrough, she was considered the most celebrated child in America, and it was said that aside from Queen Victoria, Laura Bridgman was the most famous female in the world (Gitter 4). Over time, her novelty wore off. Although she was an eager student, for years keeping lists of words she did not understand and bringing them to her teachers for explanation, she never fully grasped idiomatic English, and was frustrated by her lack of mastery (Braddy 108). As she grew older, she earned a reputation with other students as odd, rigid and grumpy, despising any person she deemed inferior to her intellect. She continuously corrected others' spelling, hated dust and dirt and demanded people wash their hands before she'd talk to them (112, 113). Bridgman's formal education ended in 1850, and she returned home to live with her family in New Hampshire (McGinnity). But her health deteriorated at home and Howe made the determination that she should return to live at Perkins. Thereafter, she was essentially a ward of the Howes', with limited options for life elsewhere. Perkins administrator Michael Anagnos remarked that she had become a "living monument to Dr. Howe's patience and sagacity," and enjoyed a relatively comfortable lifestyle and the unique status at the school of neither student nor staff (Nielson 51). By the time

Bridgman died in 1889 after a short illness, the story of Keller and Sullivan had drawn all public attention. Aside from being mentioned in the story of Helen Keller as the woman who lived at Perkins and taught the finger alphabet to Annie Sullivan, Laura Bridgman was forgotten.



Laura Bridgman, 1850. (Courtesy of Perkins Institute for the Blind)

CHAPTER III

SAMUEL GRIDLEY HOWE AND ANNIE SULLIVAN, A COMPARISON

Kate: Is it possible, even? To teach a deaf-blind child half of what an ordinary child learns—has that ever been done?

Annie: No. Dr. Howe did wonders, but—an ordinary child? No, never. But then I thought when I was going over his reports—(she indicates the one in her hand.)—he never treated them like ordinary children. More like- eggs everyone was afraid would break.—The Miracle Worker, Act I

The life stories of Laura Bridgman and Helen Keller are perhaps so different because their teachers, though they essentially had the same objective, had altogether different skill sets, motivations and teaching methodologies. Howe carefully controlled and isolated his subject, hoping to be the first man to teach language to a deaf-blind student, and equally important, to prove to society his philosophies on religion and morality, using Laura Bridgman as his *tabula rasa*. Annie Sullivan, in contrast, simply desired, with all her heart, to do the the job she was hired to do: bring Helen into the world through the acquisition of language. To that end, although Sullivan studied “every word” of Howe’s educational reports, and his was the only known proven method of teaching arbitrary language to the deaf-blind, she rejected his methodology and pioneered her own. Alexander Graham Bell said that her accomplishment was not a

miracle. It was a brilliantly successful pedagogical experiment. “It is a question of instruction we have to consider, and not a case of supernatural acquirement” (Bruce 401).

Samuel Gridley Howe began his work with the blind when he opened his father’s house on Pleasant Street, Boston, to impaired children he found on the street in August of 1832. He called it the New England Institute for the Education of the Blind (Hall, Howe 9). He was the director of the Perkins Institute, as it was later named, until his death in 1876 from a brain tumor (Freeberg 93).

Born in Boston in 1801, he grew up aware that his family was financially inferior to, and politically out of step with, the rest of Boston society. The Howes were Unitarian, as was the majority of Boston, but, unlike their conservative Federalist neighbors, belonged to the liberal Jeffersonian Democratic Republican party. He graduated from Brown University (despite his boredom with the process) and Harvard Medical School in 1824 (despite antipathy for the practice of medicine). A restless, financially-strapped idealist, he immediately began looking for ways to be useful and give meaning to his life. Without a lot of options locally, Howe set his sights overseas, over the objections of his father (Freeberg 7; Gitter 17). The Greek revolution of the 1820s provided a chance to be heroic and prove himself. He became a guerilla fighter and military surgeon, later organizing a hospital and traveling the region distributing food and clothing to impoverished Greek women and children.

He returned to Boston in 1831 a war celebrity. Handsome and revered, friends assured him that he could easily cultivate a lucrative medical practice. But Howe wasn't interested in that kind of success. He was looking for a means to solidify a reputation of heroic proportions. "Gain I look not for so much," he said. Instead, he dreamed of following a "path as yet untrodden in this country by the multitude" (S. Richards Vol. 1 385).

While Howe had been away, Boston had been under the influence of a wave of humanitarianism and reform. Religious groups rejected the old idea that suffering was inevitable and providential, embracing instead a belief in scientific progress and human perfectibility. Establishment and support of charitable organizations flourished. Among these was a new school for the blind, originally championed by Dr. John Fischer, an old friend and Harvard classmate of Howe's (Freeberg 10). Fischer was looking for someone to run the school and was struggling to find someone both interested and qualified. He discussed the challenge with Howe while they were out riding one day. Howe immediately recognized the opportunity and volunteered.

From the onset, Howe ran the school for the blind with energy and enthusiasm: developing curriculum, finding and procuring students; teaching them the skills they would need to function in the world. In his first report to the board of the New England Institute for the Blind, he wrote, "Much can be done for them, you may give the blind man the means of becoming an enlightened, happy and useful member of society . . . you may light the lamp of knowledge within them, you may enable them to read the

Scriptures themselves, - 'And thus, upon the eye-balls of the blind, to pour celestial day'" (Hall, Howe 13). His motto, "Obstacles are things meant to be overcome" illustrated his confidence and optimism (S. Richards Vol. 1 23).

The public often expressed appreciation for Howe's generous humanitarian efforts with the blind, believing that he was doing the work for no payment. Elizabeth Palmer Peabody, sister-in-law of Nathanael Hawthorne and Horace Mann, provided this glowing report in 1833: "I shall not, in all time, forget the impression made upon me by seeing the hero of the Greek Revolution . . . wholly absorbed, and applying all the energies of his genius to this humble work, and doing it as Christ did, without money . . ." (S. Richards Vol. 2 16). But his position was salaried, and he spent much of his time soliciting funds. One proven method to raise money was to hold exhibitions of the students' progress before the legislature. He had mixed feelings about displaying the impaired in this way, but he recognized it as a necessary tool; satisfying, Howe wrote, "the reasonable curiosity" of taxpayers and paying his wage (Gitter 43). The public was impressed by these demonstrations. The legislature granted him the funds needed to operate his school.

But his early success with blind students was not enough for him. He wanted to achieve the extraordinary, to do something no one else had been able to do. He was probably also inspired by Diderot's "Letter on the Blind"; he was impressed enough to have it translated into English, printed in raised letters and displayed for the blind in his school. In his writing, Diderot had written about the deaf-blind, "Perhaps they would

acquire ideas if we could make ourselves understood to them while they were still children, in some fixed determinate, and consistently uniform way; in a word, if we were to trace the same letters on their hands that we ourselves draw on paper and if the same meaning were invariably attached to them” (Jourdain 89). With this challenge in mind, Howe set out looking in earnest, and was ecstatic when he found Laura Bridgman in New Hampshire in 1837. Insulated from the outside world in her rural family home, she was the perfect subject for his research into the science of language, ideas and morality.

Howe’s approach to teaching Bridgman was nothing if not orderly. There was no room for spontaneity. Laura’s day at Perkins was carefully regimented: four hours for “intellectual labor, four hours to vocal and instrumental music, four to recreation and eating, four to manual labor, and eight to sleep” (Freeberg 84). In terms of her language development, Howe went about instructing her in the same way a teacher would a student who had already been speaking the language for years. He had her learn nouns first, then verbs, then proper nouns, prepositions, adjectives, introducing her to one part of speech at a time. For her first three years at Perkins, she was indoors, in the classroom, learning language in this slow, methodical, arduous way. Howe remarked that after all this time, she communicated like a three-year-old (Freeberg 78). If she wanted a piece of bread, for example, she would spell “Laura, bread, give;” for a drink of water: “Water, drink, Laura” (Gitter 87). A journal entry by one of Laura’s instructors exemplifies the learning process. “Uses today freely the preposition in and on; she says

'teacher sitting *in* sofa': do not dare to correct her in such cases of anomalous usage, but prefer to let her be in error, than [sic] shake her faith in a rule given; the corrections must be made by and by; the sofa having sides, she naturally says *in*" (Hall, Howe 70).

After eight years of this type of instruction Howe complained that she was "without so much acquaintance with language as a common child of six years" (Braddy 108). Howe did not realize the magnitude of Bridgman's achievement. With no formal training in teaching deaf children, he could not know that she was, in fact, using, at least with some success, grammatical constructs that typically confound deaf children. Her language skills are a testament to her willingness to apply herself with energy and enthusiasm to learning. Isolating the parts of speech and teaching her one word at a time almost certainly slowed her progress, if it didn't prevent understanding altogether. Howe taught her grammar before she had enough language to make any sense of it.

Meanwhile, as news of Howe's success with Laura spread, the public's interest in Laura Bridgman accelerated. On any day that the school was open to the public, teachers would complain that lessons were continuously interrupted by the curious and well-meaning who wished to see Laura "perform" in person, bring her gifts, touch her, and take with them a souvenir of her handiwork. Howe feared that so much attention might ruin her "present amiable simplicity of character," and he might lose control over his educational experiment. He wanted to control her, and he wanted her to have the companionship of other children. He arrived at a partial solution. He increased her isolation, moving her back to his living quarters, where, still a bachelor, he still lived with

is sister Jeannette. By way of explanation, he expressed that his relationship to Laura was that of an adopted daughter (Freeberg 63). In a letter to a Mr. Reed on June 12, 1842 he expressed the sentiment, "I am very much attached to Laura . . . I love her as if she were my own child" (63).

Further compromising Bridgman's normal social development was Howe's determination to use Laura as a tool to prove to society that spiritual goodness was an innate human quality, and that Laura, having no education in or exposure to religion, would pursue the idea of God and arrive at faith in the supreme being and salvation on her own accord, without formal indoctrination. Howe and other Unitarians in Boston, were, at the time, bitterly battling orthodox Calvinistic evangelicals over the Calvinistic idea that children were intrinsically evil. If things went as Howe planned, Bridgman would be valuable tool to help him bring about his version of religious reform. Laura Bridgman would be living proof that children didn't need to be preached fire and brimstone; to be terrified into salvation. Rather they could learn reverence for their maker by gentle leadership, example, and mind-expanding education (Gitter 142, 144; Freeman 135).

Howe devised a plan to drop subtle cues that would lead her to arrive at the truth on her own. He would teach about the science of nature, reasoning that knowledge of the miraculous process of the growth of plants and animals would spur her questions about a supernatural being who governed such things. But almost immediately something threw a wrench in his plans: Laura revealed a fear of death.

Before she came to Perkins she had been to a funeral, where she had touched the corpse, more or less by accident. She was terrified by what she had felt and experienced. When she had the language she needed, she immediately began to ask her teachers for an explanation. Howe was afraid that anything they told her would be “incorrect,” by his way of thinking. He was also afraid that she wouldn’t be put off, so he decided to tell her about the “germination and growth of plants,” hoping to give her a “consoling hope of resurrection” (Freeman 139). Laura’s questions continued regardless, and Howe could not control Laura’s discussions with fellow students; and other teachers’ comments about heaven, hell and salvation. After all, Laura was surrounded by students, teachers and visitors who were devout orthodox Christians compelled by their faith to refer to God and the promise of eternity in their daily conversations. Further, whenever there was a death at Perkins, of a person or animal, Laura’s questions about the soul, and God’s power over creation began anew. Howe would have had to place Bridgman in solitary confinement to prevent her from hearing religious rhetoric; and he very nearly did (Braddy 110).

Howe realized that for the sake of the purity of his religious experiment, he would have to take drastic measures. He wrote to Bridgman’s parents, asking for permission to be her sole spiritual counselor. They consented. He then asked visitors to refrain from discussing anything of a spiritual nature with Laura, and, to have complete control, he appointed Mary Swift as her only teacher and adult companion besides himself who would have contact with her. Swift’s assignment was to shield Laura from

exposure to religion (Freeberg 141,142; Gitter 144). All of these efforts to protect Laura from evangelical rhetoric only served to make her agitated and anxious, and had the opposite effect in regard to her thirst for information about the subject. She thought about God and asked questions about religion continuously. Not only that, but there seemed to be some confusion in her mind as to whether God and Samuel Gridley Howe might be one and the same. In one conversation with Mary Swift she mentioned that God and Howe knew all things (Braddy 110).

Howe's strict rules about Laura's religious education were still in place when he married Julia Ward in 1843 and left for Europe for a honeymoon trip that lasted sixteen months. Laura's growing fixation and agitation about God was evident in her letters to Howe. "What can I first say to God when I am wrong?" she wrote in letter soon after his departure. "Would he send me good thoughts and forgive me when I am very sad for doing wrong? Why does he not love wrong people if they love him?" (Lamson 228, 229). Howe chose not to respond. She grew more frantic, pushing Mary Swift for answers. But Swift declined, saying she would wait instead until Howe answered her himself. Bridgman sent another letter. "I want you to answer my last letter to you about God and heaven and souls and many questions." Three months later, Howe finally sent a long response: "Dear little Laura, I love you very much, I want you to be happy and good. I want you to know many things, but you must be patient . . . Your mind is young and weak, and cannot understand hard things, but by and by it will be

stronger, and you will be able to understand hard things, and I and my wife will help Miss Swift to show you all things that now you do not know” (Lamson 252, 253).

Ultimately, from Howe’s perspective, the religious experiment failed. Laura continued to look for answers on her own, regardless of Howe’s stringent controls. After decades of personal study and soul searching, Bridgman did the very thing Howe tried so hard to prevent: she joined her parents’ evangelical Baptist church, and was a rigid sectarian until her death (Gitter 147; Braddy 112).

Finally, there was perhaps one aspect of Howe’s education of Laura Bridgman that above all else profoundly affected her natural sociological development. Bridgman thought of Howe as a father, and depended on him for emotional support and affection. She was used to her place as his special student, sharing his home, treated as a daughter. But after his marriage to Julia Ward, things changed radically.

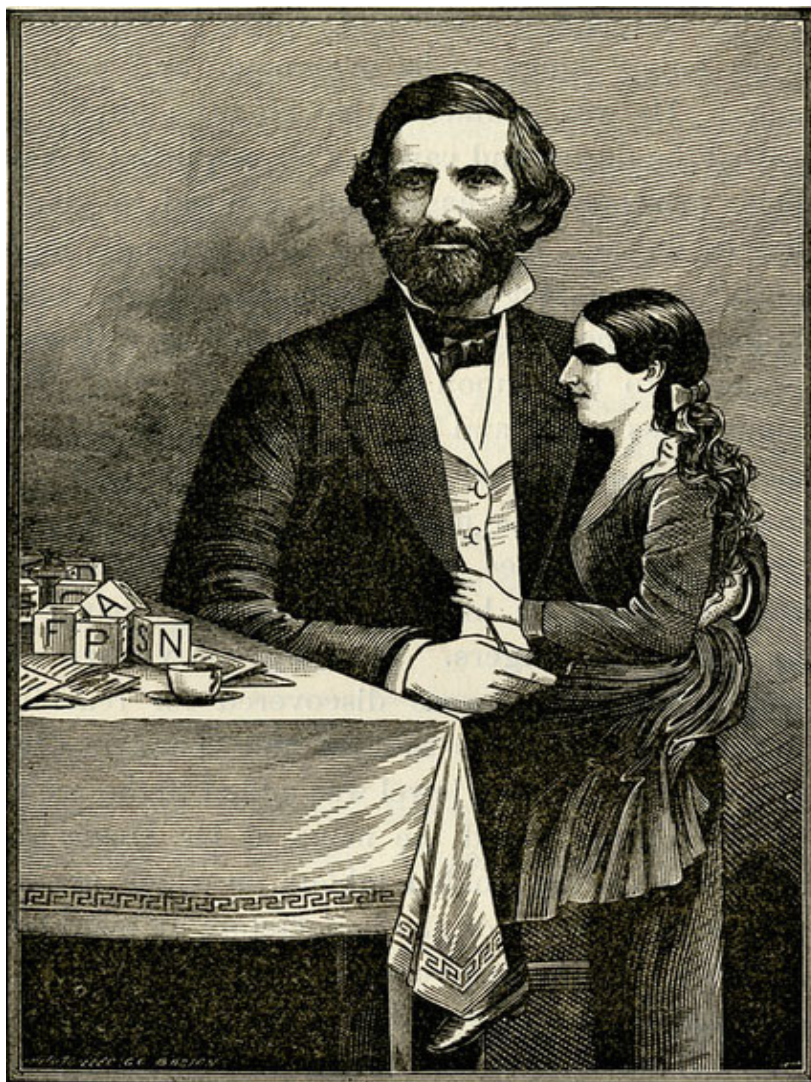
First, Howe’s marriage and subsequent extended honeymoon caused an abrupt separation from him that lasted for many months. She was lonesome for him and felt abandoned. His non-communication with her during those sixteen months only added to her distress. And Bridgman, always very sensitive to the moods of others, had, before the wedding, quickly ascertained that Julia Ward did not feel affection for her. She tried to establish a bond, sending affectionate and ingratiating letters addressed to Julia. “When you come home I shall shake your hands and hug and kiss you very hard because I love you and am your dear friend” (Lamson 247). When she learned of the birth of their baby, Laura tried desperately to paint herself into their family portrait. “I

want you to come back now . . . I thought of you and baby and Doctor many times, that they would love me very much, because I love them and you so much” (259).

To compound her feelings of abandonment, her teacher and constant companion Mary Swift left Perkins in May of 1845, and Laura, left without a daily companion, spent much of her time that summer alone. Howe made arrangements for a replacement, but Sarah Wight did not arrive until the end of August. When the Howe’s finally did arrive home in September, he shunned Bridgman. To his great dismay, while he had been gone, Laura had been exposed to answers to her religious questions against his strict prohibition, and complained that the destruction of his careful plans for her religious education was the “greatest disappointment of his life. I hardly recognize the Laura I had known” (Freeman 162). Because of his great disappointment, and perhaps because she was no longer a little girl, he withheld physical contact from the thirteen-year-old Laura. He no longer patted her, held her hand, or kissed her cheek, as he did to the other students (Braddy 112). She was jealous and confused by this withdrawal of affection. Within a year, the Howe’s family had another child, and moved from Perkins to a home near the school. Laura was moved into the girls’ dormitories (Freeman 173).

Her life at Perkins remained one of isolation. For the next five years her constant companion was her teacher Sarah Wight, and except for routine school visits from him, she had little contact with Howe. Troubling aspects of her anxious personality surfaced as she grew older; she had episodes of anorexic behavior, and displayed other

symptoms of an individual under physical and mental strain. Howe's vision for what Laura could become didn't match the person she became; he wrote, "my hopes of Laura have, in some respects been disappointed, but that is clearly because they were unreasonable" (174).



This image was created in 1889, not long after Laura died. Howe was younger than this when he taught her and he didn't use toy letter blocks. (Image courtesy of Perkins Institute for the Blind)

In 1929, Helen Keller commented that if Laura Bridgman had had Annie Sullivan as her teacher, “she would have outshone me” (Keller, Midstream 247). Sullivan’s approach to teaching Keller was virtually the opposite of Howe’s approach to teaching Laura Bridgman.

Sullivan went to Keller’s home in Tuscumbia, Alabama, in March of 1887 armed with the knowledge of Howe’s instructional method. But once she began work with Helen, she quickly recognized the mistakes in it. It made no sense to her to teach a child by imparting the elements of speech one part at a time. She knew that normal children didn’t learn language in a classroom setting, memorizing lists of words and grammatical rules. They learned to speak idiomatic English by hearing other people talk in full sentences; through a process of immersion. So Sullivan simply talked to Helen, much as a mother talks to a newborn baby. Additionally, from the onset, she taught Helen using the finger alphabet, a method Howe employed only after Laura had made the first connection to language. Sullivan’s decision to do this accelerated the process exponentially for Helen. What Howe accomplished in weeks with Bridgman took Sullivan three days. It took Bridgman three months to come to the slow realization that every thing had a name. It took Keller one.

Annie Sullivan abandoned all plans to teach Helen regular lessons, deciding instead to simply treat her like a normal two-year-old child. “I shall assume,” she wrote, “that she has the normal child’s capacity of assimilation and imitation” (Braddy 128). She was with her continuously through out the day and evening, and whenever possible,

their “classroom” was outdoors. Helen remembers that one of the first things Sullivan did was teach her how to play and have fun; she had “not laughed since since she became deaf” (Keller, Teacher 44). One morning, Sullivan took Helen’s hands and brought them up to her face, miming laughter, then spelling *laugh* into her hand. She tickled Helen until she laughed, and again spelled “laugh”. She guided Helen through the motions of different kinds of play, until “Helen was a different child, splashing radiant joy” (Keller, Teacher 45). Sullivan allowed Helen to explore and touch everything: the woods, the gardens, the rabbits in the hutch and the birds Sullivan kept in her room so Helen might feel the motion of their wings as they flew about. With vitality and youthful exuberance, Sullivan taught Helen about the world around her and in the process, gave her the words for every new thing.

Where Howe applied subtle punishment to correct Bridgman’s errors, Sullivan let Keller make mistakes and didn’t worry about them. She wrote:

She makes many mistakes of course, twists words and phrases, puts the cart before the horse, and gets herself into hopeless tangles of nouns and verbs, but so does a hearing child. I’m sure these difficulties will take of themselves. The impulse to tell is the important thing. I supply a word here and there, sometimes a sentence, and suggest something which she has forgotten or omitted or forgotten. Thus her vocabulary grows apace, and the new words germinate and bring forth new ideas; and they are the stuff heaven and earth are made of. (Keller, The Story of My Life 321)

Sullivan's goal was simple: to expand Keller's experience. As her experience grew, her vocabulary would follow. In those early days, Sullivan never made conversation for the sake of hearing herself talk. The educational goal was always at the forefront. However, Sullivan wasted no time testing Keller's knowledge. "I am convinced that the time spent by the teacher in digging out of the child what she has put into him, for the sake of satisfying herself that it has taken root, is so much time thrown away. It is much better, I think, to assume that the child is doing his part . . ." (Braddy 128).

Within two months of Sullivan's arrival, she wrote to her friend Mrs. Hopkins: "Helen is learning adjectives and adverbs as easily as she learned nouns. This morning she used the conjunction *and* for the first time. I told her to shut the door, and she added, 'and lock'" (135).

Similar to Laura Bridgman, as Helen's knowledge of language and the world advanced, she started asking questions related to the subject of God. Sullivan had been baptized Catholic but no longer adhered to any particular religion (Nielson 31). She didn't feel qualified to adequately answer Helen's questions. Michael Anagnos, of Perkins Institute, had the same philosophies on the subject as Samuel Gridley Howe. He saw this as another opportunity for an anthropological and religious experiment: he advised Sullivan to allow Helen to arrive at her own conclusions about God. But Sullivan had witnessed how that kind of approach had negatively affected Laura Bridgman; she was opposed. Instead, she sought help from the most well-known and celebrated

minister in New England: The Reverend Phillip Brooks. Brooks sat Helen on his knee and talked to her as Sullivan translated. He asked Helen what she already knew about the subject and then offered a few words about the fatherhood of God and the brotherhood of man. When he left to pastor a church in England, he continued to write long letters to Helen. For years, Helen received instruction from him, even after he was made bishop, and until he died in 1893 (Braddy 150).

Sullivan had confidence, beyond her twenty years, that she knew what was best for Keller, and that she had an innate ability to pinpoint the best instructional method for her advancement. Moreover, the longer she worked with Helen, the more evident it became that her motivation was no longer purely pedagogical in nature. She loved Helen and was intensely concerned for her well-being. After only three months with Helen, she wrote to Hopkins:

I should think Helen's education should surpass in interest and wonder Dr. Howe's achievement. I know that she has remarkable powers, and I believe that I shall be able to develop and mould [sic] them. I cannot tell how I know these things. I had no ideas a short time ago how to go to work; I was feeling about in the dark, but somehow I know now, and I know what I know. I can't explain it, but when difficulties rise, I am not perplexed or doubtful. I know how to meet them. I seem to divine Helen's peculiar needs. It is wonderful. (Keller, The Story of My Life 325)

She told Hopkins that she would share details of her educational experience with Helen on one condition: she could not share her letters with anyone. “My beautiful Helen shall not be transformed into a prodigy if I can help it” (325).



Annie Sullivan and Helen Keller July, 1888. (Courtesy of The American Foundation for the Blind)

For the remainder of Helen Keller’s life, Annie Sullivan was her constant companion. After her arrival in Tuscumbia, there was never a time that Sullivan was not at Helen’s side; even after Sullivan’s marriage to John Macy. Up until the time of Sullivan’s death in 1935, they lived their lives conjoined. Helen Keller was Sullivan’s family; she had very

little contact with what remained of her birth family, and she felt “in every heartbeat that I belong to Helen” (Hermann 57). Helen admired and loved her dearly. In Teacher, Keller’s biography of Annie Sullivan, Helen wrote: “I hope I may convey to my readers some gleams from the opal fires in the nature of a woman with a heart for glorious living and an eye for the ‘beauty beyond dream’” (36). In a paper she wrote in 1894 for the annual meeting of The American Association to Promote the Teaching of Speech to the Deaf, Annie Sullivan summed up the success of her method:

To have another Helen Keller, there must be another Miss Sullivan . . . Surely Dr. Howe is wrong when he says, “A teacher cannot be a child.” That is just what the teacher of the deaf child must be, a child ready to play and romp, and interested in all childish things . . . It was to a good subject that Miss Sullivan brought her devotion and intelligence and fearless willingness to experiment. Miss Sullivan’s methods were so good that even without the the practical result, anyone would recognize the truth of the teacher’s ideas. (Keller, The Story of My Life 383)

When philosopher William James met Helen Keller he remarked that Laura Bridgman was “anemic” compared to Helen. Bridgman was a beacon of morality, but “morbidly so.” Helen Keller, in contrast, was an example of “vital exuberance. Life for her is a series of adventures, rushed at with enthusiasm and fun” (Freeberg 217). Clearly, the divergent experiences with their primary educators profoundly influenced the quality and outcomes of their lives.

CHAPTER IV

FEVER

“Main thing is, the fever’s gone, these things come and go in infants, never know why. Call it acute congestion of the stomach and brain.” – The Miracle Worker, Act I

In February of 1882, when Helen Keller was 19 months old, she contracted a fever that doctors feared she wouldn’t survive. The exact nature of the fever has never been diagnosed, but at the time, her doctor called it an acute congestion of the stomach and brain, or brain fever. She recovered from the fever, but in the slow days of recovery after it, Keller remembers her mother attempting to soothe the pain in her eyes, which, she says, would wake her from her sleep. Her eyes were dry and hot and she kept them turned “to the wall, away from the beloved light, which came to me dim and yet more dim, each day” (Keller, The Story of My Life 26). When Kate Keller passed her hand in front of her baby’s eyes and they didn’t close, and she rang a dinner bell and the toddler didn’t respond, she realized that her daughter was blind and deaf. After her recovery, tests revealed that Keller could see neither light nor objects, and she had neither bone nor air conduction in either ear (Tilney).

The symptoms and outcome of Keller’s illness are consistent with two other illnesses common in childhood and difficult to treat in the 19th century: spinal meningitis and scarlet fever, and, until recently, modern doctors believed it was one of these two

that arrested Keller's vision and hearing. More recent studies, however, point to viral meningoencephalitis as the probable cause. In the 1880s, it was impossible to isolate the type of virus or bacteria that caused these severe fevers, and because many of the illnesses had nearly identical symptoms, doctors were only sometimes able to make a definitive diagnosis postmortem. Because of this, 19th century doctors often lumped many such damaging and often fatal illnesses under the broad name brain fever (Reynolds 844).

In the late 19th century, brain fever, or acute congestion of the brain, was defined as an "overfullness of the capillary and other blood vessels" (Reynolds 851). The diagnosis of acute congestion of the brain actually identified several illnesses that were very different from one another. One type manifested a high fever, another an attack of paralytic stroke, still another convulsion, and a fourth caused delirium and wandering.

Patients diagnosed with brain fever often died, and any postmortem examination would have shown an abnormal appearance of the brain, which doctors at that time described simply as "congestion"; or an excess of blood in the brain. In Reynolds' System of Medicine, published in 1879, doctors J. Russell Reynolds and H. Charlton Bastian explained why diagnosis was difficult. "We cannot yet determine the truth of these surmises or inferences, for we cannot see the brain while the symptoms last and the most characteristic often pass away when the patients die" (845). Even if

there was excess blood in the brain, by the time doctors performed an autopsy, most of the blood would have been reabsorbed.

Keller's doctor would have made his diagnosis based on his observations of her symptoms, which match the febrile form of brain congestion. "In infancy and early childhood, congestion of the brain may occur with marked elevation of temperature, dry skin, thirst, and the restlessness and malaise of a pyretic (fevered) state" (847). Other symptoms were dull, chronic headache, hot forehead, flushed cheeks and conjunctivae (eye lids), and fitful sleep. The patient might vomit, but not persistently, and they most often didn't suffer from diarrhea. Patients were typically not light or sound sensitive.

Sometimes, patients diagnosed with brain fever would recover quickly and with no lasting distress or additional symptoms; but most often the symptoms would worsen, the patient would become unresponsive, then comatose; all bodily control would be lost, convulsions might occur, but in the end, the patient would "lie quietly, with labored pulse and breathing and with flickering contractions of the muscles of the limbs," until he died (848).

Doctors of the 19th century guessed at answering the question of why congestion of the brain occurred. At one time, a change in barometric pressure was thought to affect the flow of blood in the brain. But this theory was thrown out. The idea that gravity, and the position of the head might cause sudden illness was another primitive theory later debunked. They knew it had something to do with either inflammation, in

the case of fever, or hemorrhage, in the case of a paralytic stroke, and there also seemed to be much evidence supporting that an obstruction of a blood vessel could cause a hemorrhage, or other brain accident, but the knowledge of the brain at this time in medicine was rudimentary in comparison to 20th century advances in medicine, and the pathology of the disease could not “be said to have been ascertained in a thoroughly satisfactory manner” (853). Regardless of the true pathogenic cause of the disease, doctors were limited to the treatment options available and often relied on ancient and primitive methods.

Bloodletting was the treatment of choice, depending on the age and condition of the patient, and the symptoms they exhibited. In the case of fever and headache, leeches applied to the temple were proven to provide relief. General bleeding at the back of the neck through the use of cupping (three or four ounces for adults) brought the same results. But bleeding sometimes made things worse, and it was important for the doctor to make the determination immediately if the bleeding seemed to cause more agitation.

It was advised to raise the patient’s head, and “to apply cold water or ice to the forehead, and place the hands and feet in hot baths” (854). Warm water or olive oil enemas were routine because doctors felt that it was very important to “empty the rectum.” If the stomach was over full of food, a mustard or ipecac emetic was recommended to empty it (854).

The employment of blood letting, enemas and emetics is consistent with the centuries old belief held by 19th century medicinal practitioners that the health of the body was governed by four humours: blood, phlegm, black bile and yellow bile. If the humours were in balance, the body was healthy. Illness occurred when the humours were out of balance, and in order to put things right, the body was often subjected to purging techniques like blood-letting and enemas. Reynolds and Bastian recommend cupping, a technique mentioned by Hippocrates in the fifth century B.C. and used by ancient Chinese, Native American, Egyptian, and Islamic physicians. The method was employed to draw excessive humours to the surface of the body. In the 1800s, cupping was used to treat a variety of illnesses, including chest pain, indigestion, muscular problems, colds, fevers, and influenza.

A diagnosis of acute spinal meningitis would have matched several of Keller's symptoms and complications. Meningitis is caused by an inflammation of the lining of the brain and spinal cord and in 1882 was most often fatal; from the onset of symptoms to death was routinely a matter of a day or two. Infants and very young children are more susceptible to meningitis than any other age group. A treatise by J. Spence Ramskill, in Reynolds System of Medicine, published in 1879, outlines the pathology and treatment for the illness. The disease is divided into three stages, and the stages move from one to the next very quickly. In stage one, the first symptom in children is convulsions. Other symptoms rapidly appear, including extreme sensitivity to light and sound; patients keep eyes tightly closed and turned away from all light, and refuses all

requests by the doctor to open them. The least sound, even the quietest footsteps can cause pain. High fever is accompanied by hot, dry, flushed or pale skin. But the most marked symptom is headache and neck pain; constant and continuous, lasting the duration of the illness. At times, the headache will become excruciating, and the patient, if a young child, will “utter a peculiar, loud, piercing cry” (Reynolds 808). Patients describe the pain as violent, shooting pains, or as iron bands encircling the forehead, or as the head squeezed in a vice. Not surprisingly, vomiting accompanies the extreme head pain.

For any hope of recovery, Keller’s doctor would have wanted to begin treatments in earnest very early in the disease. Modern medicine aggressively treats the disease with strong intravenous broad spectrum antibiotics to kill the infection, and cortisone anti-inflammatories to reduce the swelling in the brain. In the late 1800s, three measures were taken: blood letting, purgatives, and cold compresses to the head. With very young children, blood letting through a vein was not recommended, and the application of leeches to the head intensified headache pain, so leeches were either applied to the anus or to the ankles. Doctors also described success with treating children by applying leeches to the back of the neck. Cut cups were sometimes used instead of leeches because they produced the same results in less time.

Purging aided “bleeding in producing its full effects” (815). Croton oil was administered to small children, and had “certainty and rapidity” of results (815). Croton oil is poisonous and can be lethal. Even the smallest dose produces diarrhea, and 19th

century practitioners needed expertise and knowledge of just the right concentration to use it safely. Also toxic, mercury was given in small and repeated doses and was considered a very valuable purging tool.

Cold compresses were believed the most important and effective treatment available for lowering the fever, reducing the pain, and calming the delirium that would appear in the last stage of meningitis. Wet, cold cloths were considered the least effective means of cold application because, against the burning forehead, the cloth quickly became warm and dry, which produced the opposite result desired. Doctors believed that alternating between cold wet and hot dry compresses attracted more blood to the head. A preferred method was using a bladder full of crushed ice, or a combination of ice and salt. Doctors appreciated that the bag could conform to the shape of the head. The most effective method was irrigation; a small stream of cool water was allowed to run on the head from a small vessel suspended above it. Although great caution was advised when using it with young children because it was believed to have a powerful sedative influence, the results on the young were observed to be “almost magical” (810). To increase the effectiveness of cold application, the patient’s hair was shaved close.

Complications of meningitis are very serious and the longer the fever continues, the greater the risk of neurological damage. Hearing loss, learning disabilities, brain damage, seizures, memory loss, and kidney failure are associated with untreated meningitis (Smith). These complications are part of the reason science has rejected

spinal meningitis as the cause of Keller's blindness. Any neurological damage done by the bacteria would have affected more than just hearing and vision; Keller would have been mentally incapacitated in some way too.

One hundred and fifty years ago, the mention of the possibility of a scarlet fever diagnosis was enough to cause panic in a community, and for good reason. Parents could lose all of their children in a matter of weeks during an outbreak. It is the illness associated, in some cases erroneously, with well known literary figures. Mary Ingalls, sister to Laura Ingalls Wilder, lost her sight in 1879, and scarlet fever was blamed; Louisa May Alcott's character Beth March in her book Little Women, died of complications from scarlet fever, and is modeled after Alcott's sister Betty. Alcott wrote in her journal, "Home to find dear Betty ill with scarlet fever caught from some poor children mother nursed . . ." (Cheney 84). Neil Simon's autobiographical play *Lost in Yonkers* features Aunt Bella, the daughter of Grandma Kurnitz. "Bella was born with scarlet fever and didn't talk until she was five years old" (Simon). The common appearance in literature reflects its epidemic proportions in Europe and the U.S. between 1825 and 1885. Between 1840-1883, scarlet fever was the most common infectious disease to cause death in children. 30% of cases of recorded cases ended in death (Smith).

In the late 1880s doctors felt more confident in their diagnosis and treatment of scarlet fever than most other childhood disease; the disease had been around a long time. Twenty-five hundred years ago, Hippocrates had recorded illnesses with symptoms that match scarlet fever. It has been closely observed and described since

Sicilian doctor Giovanni Filippo Ingrassia first published an article in 1553 about an illness afflicting children that involved a high fever and a rash. He referred to it as rossalia or rossania (Reynolds 83).

Scarlet fever is caused by the bacteria *streptococcus pyogenes*, although at the time of Keller's illness, doctors would not have been able to identify the bacteria. In 1872; the cause was noted simply as "contagion." The illness typically starts with a sore throat, fever, and nausea. The tongue becomes covered with a light white fur. As the illness progresses, a red rash appears, most often on the torso and neck, but sometimes on the legs (Smith). The disease is also characterized by a high fever, headache, nausea and vomiting, dizziness and delirium in the worst cases (Reynolds 88). Victorian age doctors also made a separate designation of more dramatic and fatal variation of scarlet fever: malignant scarlet fever. These cases were virtually always fatal in patients under the age of 12, and the course of the disease was very short, ranging from approximately two days to a matter of hours. Doctors practiced in the treatment of scarlet fever would almost certainly be able to ascertain which cases would be fatal from the first observation of the patient. Malignant scarlet fever symptoms were violent; the bacteria quickly affected the central nervous system. Vomiting and fever were followed rapidly by delirium, thrashing and convulsions (87). But in short order, the patient would become comatose and die.

The treatment of scarlet fever in the late 1800s is detailed in an exhaustive treatise contributed by Samuel Jones Gee, one of the most well known and influential

physicians of the Victorian era. Pages of treatment protocol, to be strictly adhered to, instruct caretakers to first pay attention to the bedroom (the patient was in bed, of course, for the duration of the illness, and for at least three weeks beyond the disappearance of all symptoms). All carpets, curtains and all porous materials would be removed and the room well-ventilated, "in part by an open fire" (Reynolds 95). Gee's instructions for younger children go on to order the use of a syringe to deliver a diluted solution of silver nitrate into the nasal cavity. Cold infusion was also recommended for severe cases. This involved seating the patient in a bathtub, and three buckets full of water at the temperature of 70 degrees were dumped over their head. The patient was then returned to bed without toweling off and covered in a sheet. If the fever was especially high, Gee reported seeing very good results from "packing the patient in a wet sheet for an hour." Ammonia, brandy, "a liberal allowance of wine", quinine, and sulphuric acid were nearly always prescribed at various stages of the illness. Gee recommended purging in cases "attended by stupor, without reduction of temperature or marked feebleness of pulse" (96). He also suggested blood letting, but only when the attending physician was assured it would not cause more harm, and if there were other symptoms beyond that of scarlet fever.

In the late 1800s and early 1900s, scarlet fever was one of the most often mentioned causes of blindness. But scarlet fever doesn't cause blindness, and, like meningitis, any bacterial infection that caused damage to the senses would have caused other neurological brain damage too (Smith). Samuel G. Howe was astonished to find

Laura Bridgman in New England. He was aware that healthy deaf-blind who did not suffer from other neurological disorders were very rare. Howe also knew that the 18th century Abbé Sicard, in all of his years working with the deaf, never found even one otherwise healthy deaf-blind (Gitter 67). Most were born that way, the result of congenital abnormalities such as fetal alcohol syndrome, hydrocephaly or microcephaly; or they were exposed prenatally to infectious diseases like rubella, syphilis, toxoplasmosis or herpes (Ulrich 40, 44-45). Mary Ingalls, sister to autobiographical writer Laura Ingalls Wilder, went blind from a childhood febrile illness in the 1870s. In her book, By the Shores of Silver Lake, Wilder wrote that scarlet fever was to blame. “Mary and Carrie and baby Grace and Ma had all had scarlet fever. The Nelsons across the creek had had it too, so there had been no one to help Pa and Laura. The doctor had come every day; Pa did not know how he could pay the bill. Far worst of all, the fever had settled in Mary’s eyes, and Mary was blind” (68). But Wilder’s Little House series illustrates clearly that Mary Ingalls was, like Keller, as “bright as ever” after her illness, with no other brain damage. Like Keller, Ingalls’ illness was originally listed in a historical register as brain fever. Wilder was aware that it wasn’t scarlet fever but rather some other kind of fever affecting the brain that caused the blindness and scientists speculate that Wilder was advised by her editors to use scarlet fever as a diagnosis because it would be more recognizable to her audience of children (Smith). In the 19th century, readers would have been much more familiar with scarlet fever than with meningoencephalitis, or any other type of bacterial or viral febrile illness.

Science is still trying to pinpoint the probable cause of Helen Keller's illness nearly fifty years after her death. In the last few years, medical researchers have thrown out earlier theories of possible diagnoses and has focused on the high probability that it was viral meningoencephalitis that caused her blindness and loss of hearing. The illness can be caused by several root viruses, and approximately 20,000 cases of meningoencephalitis are diagnosed in the U.S. each year (Kasper 614). It's impossible to know how many cases were misdiagnosed in the late 1800s.

Meningoencephalitis is combination of meningitis, an inflammation of the spinal column and the meninges, the lining of the brain; and encephalitis, an inflammation of the brain. The most common symptoms are high fever and severe headache, but more serious cases cause nausea, vomiting, dizziness and coma. Severe cases also cause the neck and spine to become painfully rigid and a baby with viral meningoencephalitis will often emit a high pitched scream when they are picked up. The brain swelling associated with meningoencephalitis can cause a wide range of residual problems including severe damage to all of the senses, including smell and taste, and, as in the case of Mary Ingalls, paralysis of facial muscles was also common.

While it may not be necessary to have an exact diagnosis of Helen's illness to successfully stage *The Miracle Worker*, an understanding of the medical theories and treatments of the late 1800s certainly could enrich the over-all production experience, and any program notes can avoid the common error of naming scarlet fever as the cause of her hearing and vision loss.

CHAPTER IV

TRACHOMA

Keller: Miss Sullivan, I find it difficult to talk through those glasses.

Annie: (Eagerly, removing them) Oh, of course.

Keller: (Dourly) Why do you wear them, the sun has been down for an hour?

Annie: (Pleasantly) Any kind of light hurts my eyes. –The Miracle Worker, Act II

Annie Sullivan was around seven years old when she contracted trachoma, an infectious disease of the eye, caused by the bacteria *chlamydia trachomatis* (Schlosser). As far back as she could remember she was troubled by it (Keller, Teacher 9). Her first conscious memory was the comment made about her, “She would be so pretty if it were not for her eyes” (Braddy 6). She would suffer from the effects of it all of her life.

Trachoma is one of the oldest recorded human diseases; evidence of it has been found in writings and archeological studies dating to 8000 B.C. It was not until the 20th century A.D. that a relatively successful treatment was discovered when Fred Loe, MD, a self-taught ophthalmologist, working on an American Indian reservation in 1938, introduced the use of sulfanilamide with a 90% cure rate (Schlosser).

In those thousands of years between, millions were blinded, including St Paul, Horace and Galileo, and a myriad of treatments were developed attempting to mitigate the effects of the disease. Medical scholars have traced trachoma from its presumed

origins in Australia to ancient Egypt, Greece and Rome. Mention of the word “trachoma” is found in Roman medical texts as early as 60 A.D. In addition to technical discourse, cultural references can be found in the texts of ancient Greek plays. Aristophanes, for instance, alludes to blindness in his play, *Plutus*. The title character tells Chremylus that Zeus has punished him with blindness. Scholars believe that this may be an allusion to trachoma, which was epidemic in Greece at the time of the play’s writing in 380 B.C. (Schlosser).

Today, prevention protocol is known and utilized, and effective treatments are more widely available, but trachoma is still a disease that is endemic in third world countries. Trachoma originates by infection carried from another affected eye, and is spread through contact with hands and clothing. It is most associated with the poor. Lack of adequate clean water and sanitation were and are the common threads in populations with high numbers of the disease. In Sullivan’s time, trachoma was associated with “unhygienic habits of life, contagion, and scrofula” (Hansell, Bell 99). Scrofula is a term connected with the tuberculosis bacteria. With children under the age of eight years, however, scrofula refers to a non-tubercular strain of the bacteria. In the 1800s, trachoma was found most frequently in barracks, asylums, poor houses; anywhere that inhabitants might be careless “in the use of towels, handkerchiefs and other similar personal articles” (Schweigger 162). Professor C. Schweigger’s medical textbook Ophthalmology, published 1872, was the third edition translated from an original German text. He notes that incidents were high in immigrants “especially the

Jews.” In contrast, he notes that the “American negro” seemed “immune to the affection” (62). In The Manual or Clinical Ophthalmology, Doctors Howard Hansell and James Bell indicated that Germans, Italians, Poles, Hungarians, Egyptians and Italians “were particularly susceptible,” and the two doctors could not determine if this was because of their “peculiar temperaments” or from faulty sanitation (92). It affected young people most often; the ages between fifteen and thirty were vulnerable, and the disease most often affected both eyes. Professor Schweigger, of the University of Berlin, in the latter half of the 19th century, claimed that there was a geographic connection to the disease; low, damp areas more favorable to trachoma than high mountainous regions. “Switzerland for instance,” he said, was “entirely free of trachoma” (62). In the 19th century, the disease was an epidemic in much of the world, including the U.S. (Schlosser). Sullivan’s squalid, impoverished childhood in the late 1860s would have created ideal conditions for this and other infections to occur. Indeed, of the five children born to Sullivan’s parents, only Anne and her younger sister Mary would survive to adulthood (Braddy 11).

By the early 20th century, U.S. and Canadian officials were so concerned about European immigrants spreading the disease that they instituted eye examinations at entrance ports like Ellis Island. Medical personnel utilized a buttonhook to flip the eyelid of every person entering the country to look for tell tale signs of trachoma (see fig. 1). If the disease was detected, the immigrant was most often sent back to their native country. Concern about the examinations themselves spreading the disease was

warranted. Medical staff was instructed to sanitize the hook between every examination, but because of time constraints and the volume of immigrants, this was rarely done (Schlosser).

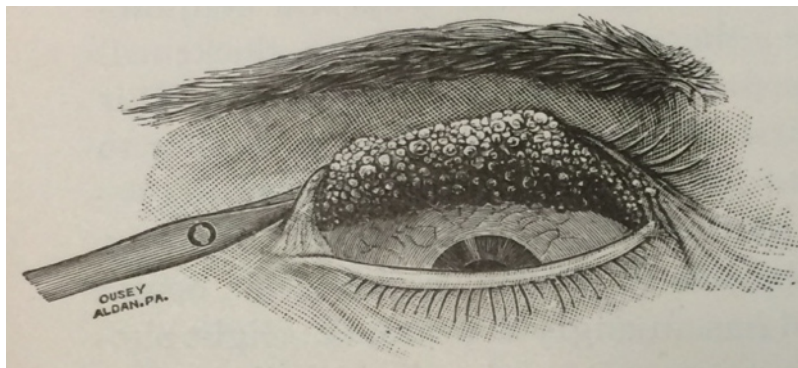


Fig. 1. Detecting trachoma by flipping the lid with a hook tool. (All eye images courtesy of University of Minnesota Medical Library.)

Trachoma does not cause blindness right away; the first infectious incident usually clears up on its own (Schlosser). But the disease is chronic, and the damage to the eye worsens as it progresses. In the early stages, the disease causes pain, burning, itching of the lids, yellow or clear discharge which causes the lids to stick together, sensitivity to light and vision disturbances (Bell 98; Walters 19). The inner eyelid, or conjunctiva, becomes red and thick. Over time, raspberry-like projections form; these are called trachoma granules. The progression to acute trachoma may take many years, but gradually the granules cause scarring and distortion of the conjunctiva, which causes the eyelashes to turn inward, a condition known as trichiasis (see fig. 2). This development causes the continual scratching and scarring of the cornea. Left untreated, trachoma causes deformity of the eyelids, permanent drooping of the

eyelids, limits the movement of the eyeball, and clouds the cornea (Bell 99). It is a long, slow and tortuously painful progression to blindness (Walters 23).

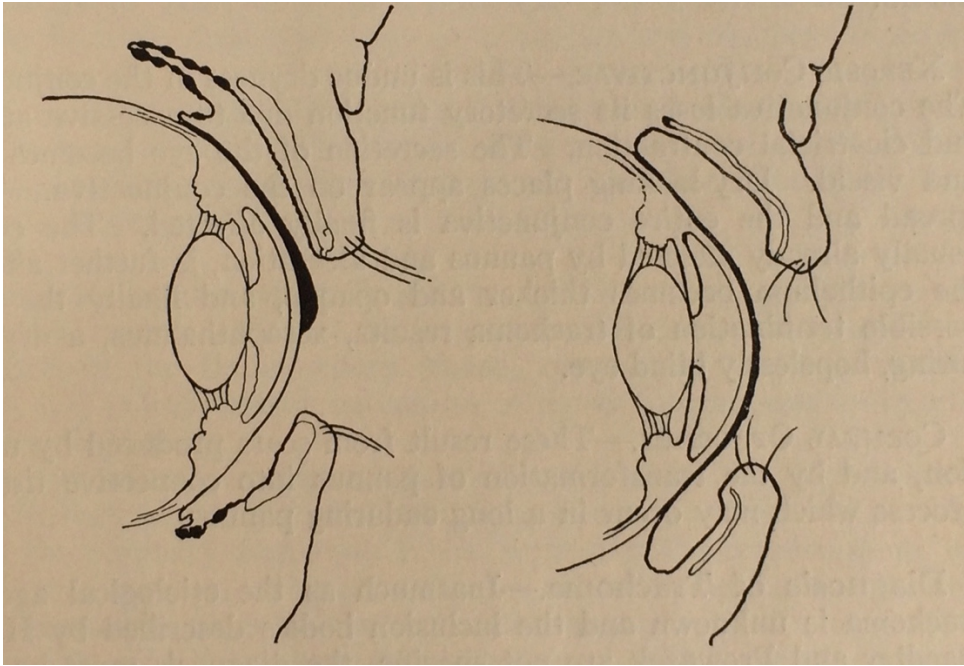


Fig. 2. Distortion of the eyelid.

At the time of Sullivan’s diagnosis, there was little hope for a favorable prognosis. Complete recovery was very rare, and treatment was rudimentary (Bell 99). In early 19th century England, for example, soldiers with trachoma were treated by “removing of granulations, various eye washes, and blood letting”, in which an incision was made near the eye and blood was allowed to flow until the patient fainted (Schlosser). In the 1860s, medicine urged that, “the treatment must, in the first place, be directed toward improving the hygienic surroundings of the patient, removing hurtful influences, and all means employed to prevent the spread of the disease” (Schweiger 270). Home remedies were common. Sullivan remembered a neighbor recommending

a wash using “geranium water” and her mother gathering the petals from the flowers for this purpose (Braddy 6). Medical texts written at the time acknowledge that most available treatments were palliative at best (Bell, Hansell 100). Until the middle of the 20th century, doctors applied “caustics” to the eye as a long-term treatment plan to reduce inflammation and distortion of the conjunctiva. The objective was to improve the health of the mucus membrane, not to destroy the abnormalities on the surface of the conjunctiva. A two percent solution of silver nitrate was prescribed, “...once daily, applied directly to the conjunctiva with a tooth pick swab” (Fox 723). Applications of leeches, bi-chloride of mercury, and cold water baths were widely used. The use of crystals of copper sulphate was considered to be the best remedy; applied directly to the cornea with a camel hair brush and then wiped off immediately. This treatment often brought rapid, but temporary improvement, and doctors prescribed the continued use of a salve made from a blend of one-part copper sulphate solution to 100 parts glycerin. These treatments would have been employed for many months or years, but the symptoms were rarely eliminated, and the applications were painful (732). Before either the silver nitrate or copper sulphate eyewash could be administered, a local anesthesia of one percent butyn or four percent cocaine or other narcotic had to be used to diminish the pain caused by the wash. “A dilute solution of tincture of opium...does good service” (Schweigger 282). Some patients could tolerate neither the silver nitrate nor the copper sulphate, even with the cocaine or opium, in which case a milder wash made from 1% or 2% acetate of lead or tannic acid was recommended.

(282). Despite the availability of these treatments, frequently the patient could either not tolerate the pain, or the trachoma symptoms would be aggravated. In those cases, doctors advised that it was “well to use warm fomentations, either cataplasms or warm vapor directed against the eye” (283). The desired result was the discharge of pus and other secretions from the eye. Once that happened, mild applications of copper sulphate, silver nitrate, or other available local applications were tried again.

In addition to the application of local caustic solutions, cauterization was used to attempt removal of the trachoma granules and restore the conjunctiva to health. Other mechanical means were used. Special forceps, named Knapp forceps, were developed for pressing out the granules. The use of thumb nails was sanctioned for the same purpose. No matter the tool used, the method was extremely painful and the use of general anesthesia was recommended.

Surgeries on the eye were performed to produce a faster end to the inflammation phase of the disease, when all other means of treatment failed. In the late 1800s, these surgeries were most often conducted under a general anesthetic; ether and chloroform were the most commonly used chemicals. Even in later years, when local anesthetics were available, general anesthetics were recommended, especially for children, because “of the great pain incident” to these procedures (Walters 3).

Weeks prior to the ophthalmologic operation, doctors might request that the patient limit the diet to vegetables (Fox 295). Moderate exercise was acceptable, and

“an abundance of rest and sleep” was also advised (295). Patients were admitted to the hospital twenty-four hours before surgery to allow time for thorough physical and laboratory examinations. Doctors would perform examinations to rule out the presence of any heart or lung conditions that would contraindicate anesthesia. They would also be on the lookout for rheumatism or syphilis, although questioning in this direction was difficult and it was thought better to “avoid undue questioning in such cases” (Fox 295). Instead, patients were often prescribed a preventative solution of strontium salicylate and mercury with chalk for three days prior to the operation. Once in the hospital though, the patient was expected to lie quietly in bed. A tepid bath was recommended, along with a laxative for the night before, with a soap and water or salt water enema given in the morning. Tea and toast breakfast was allowed if the operation was in the afternoon, “but no luncheon” was given (296). Preparation to the eye began the night before. The eye lashes were clipped short, the eye washed and packed with a solution of boric acid, bi-chloride ointment and Vaseline and bandaged for the night. In the morning, washing and irrigation of the eye continued every five minutes for one hour before the operation (Walters 3).

While rubber gloves were being used for some surgeries in 1877, the time of Sullivan’s first operations, her surgeon would not have used them because of the delicate nature of the inner eye procedure (Lathan 389; Walters 2). Instead, the doctor would have washed his hands well, then immersed them in alcohol or other germicidal

solution. Instruments were soaked in alcohol fifteen to thirty minutes prior to surgery (Fox 296).

Few surgical options were available for Sullivan, and the method used would have depended on the symptoms she was exhibiting. All were invasive and involved rudimentary follow-up care.

The procedure with the quickest and most permanent results was called grattage. The upper lid was grasped with forceps and turned outward to expose the affected conjunctiva. A spatula was inserted to protect the cornea, and the exposed lid was scarified, or cut multiple times with a three-bladed scalpel. The granules were then scraped off with a toothbrush that was soaked in a corrosive solution “just before being used” (Schweigger 165). These steps were repeated until all granules are gone. If the granules were softer and more gelatinous, an ordinary gauze sponge could be used instead of a toothbrush, and would leave the conjunctiva “perfectly smooth.” In situations where the granules are extremely stubborn, sandpaper was used with “much success in similar cases” (166).

Because trachoma often limited the movement of the eye, a subsequent procedure was used in combination with grattage. This operation, called a Barrows, involved splitting the cartilage from the inner to the outer canthus (upper eyelid). Although the operation was harsh, the results were often favorable because it relieved the pressure on the eye ball caused by the trachoma, and subsequently reduced the pain. The recovering patient was put to bed, the eyes covered with lotion-saturated

pads, for three days. Doctors reports “exceedingly gratifying” results if the operation was “properly carried out” (Schweigger 167).

Another type of surgery involved peeling the eyelids open and clamping them so that the conjunctiva was exposed, and then using a roller forceps tool, which was drawn down the length of the exposed lid, crushing the trachoma granules. In cases where the granules were very large, preliminary scoring with a knife was recommended before using the forceps. Follow-up treatment involved a combination of cold compresses and boric acid washes (Walters 23).

In later stages of trachoma, the eyelid turns inward and the eyelashes scratch the cornea. It was advised to remove the diverted lashes. Sometimes, lashes were removed by the patient themselves. In the more severe stage, another type of surgery was indicated if the lashes had begun to turn inward and all other treatments failed to produce results. This involved removing a layer of the inner upper or lower lid, called the fornix (see fig. 3).

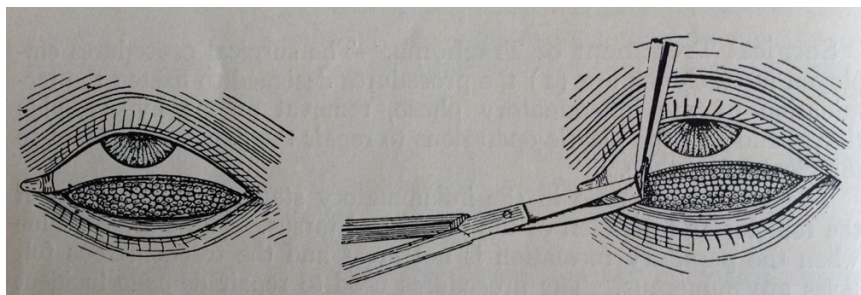


Fig. 3: Fornix operation. Removing a layer of the lower or upper lid affected by trachoma granules.

No records exist as to the exact nature of Sullivan's surgical procedures, but she reported that she endured five ineffective and painful operations on her eyes before she was twelve years old (Braddy 20 32 35). They did nothing to restore her vision, or eliminate the trachoma symptoms. In later life, she wrote "I have endured much physical pain and I can feel real pity for anyone who suffers" (Sullivan, "Foolish Remarks").

Subsequent operations were performed on Sullivan at the Massachusetts Eye and Ear Infirmary, in 1881 and '82; one on each eye, exactly one year apart, while she was enrolled at the Perkins Institute. The procedures were most likely corrective in nature and involved surgery to the cornea to repair the scarring and rupturing associated with acute trachoma. These operations were successful and allowed her to regain some of her sight after nearly ten years of blindness (Braddy 35). Her vision was restored to the degree that Sullivan could read printed words on a page, but her eyes were still slightly crossed, a medical condition known as strabismus. In March of 1887, she had one more surgery to correct this misalignment in her right eye with one of the following procedures, depending on the type of strabismus (Nielson 75). In a procedure called a tenotomy, a curved incision was made on the nose side of the eye socket, the eye was held open with retractors, the conjunctiva was irrigated with boric acid as often as necessary to insure that the area stayed as germ-free as possible, the correct tendon was carefully isolated, dissected free, and cut. Sutures closed the incision and a tight dressing was applied (Walters 89; Fox 96). In a tendon tucking, the tendon was isolated

and shortened. A permanent tuck was taken and secured with sutures (Walters 93).

(see fig. 4)

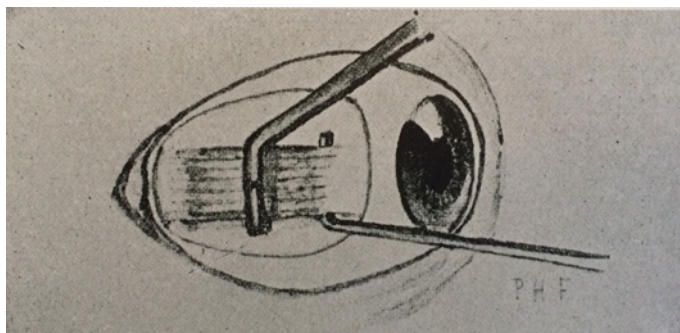


Fig. 4. A tendon tuck, used to correct strabismus.

This latest operation was done two days before she embarked on an arduous, several days' train journey to the Keller home in Alabama, and she cried in pain for much of the journey there. One night, she woke to an intense pain in the recovering eye, describing it as feeling like "a red-hot coal" (Hermann 40). On her arrival to Tuscumbia, both eyes were red, irritated, swollen and sore.

Although the pain was almost surely constant, Sullivan made very little of it. It didn't diminish her efforts; uncomplaining, she threw all of her energy toward the goal of teaching language to Helen. Three days after her arrival at the Keller home, Sullivan wrote a letter, several pages long, to Mrs. Sophia Hopkins, a friend from Perkins Institute. In it, she details, almost minute by minute, all that transpired between Helen and herself from the moment of her arrival. In the final paragraph she mentions, briefly, "My eyes are very much inflamed." But this is more an apology for the condition of her handwriting, than a complaint about the pain (Keller, The Story of my Life 307).

Months later, her eyes were still recovering. In a letter to her friend Mrs. Sophia Hopkins dated May 22nd, she wrote: “My eyes are still much red and swollen; but I think the operation was a success and that I should have got over the effect of it more quickly if I had not come South so soon. The train dust and heat retarded the healing process somewhat” (Braddy 135)

Any degree of light caused irritation, and she wore dark glasses continuously, indoors and out. She wrote to Hopkins, “The smoked glassed you sent me are fine. I wear them all the time and find they help me, especially out of doors” (135).

Sullivan would go on to have several more operations, and her struggle with vision loss and eye pain associated with trachoma would be ongoing. By 1929, she had lost all but a fraction of her vision in both eyes, and her right eye caused her so much pain that it was removed to improve her overall health. By age sixty-seven, she had lost all of her vision (Lash 588).

Annie Sullivan was in constant pain in those early weeks with Helen Keller, but she didn't allow that pain to diminish her resolve or hinder her efforts in any way; this would be the way she would live out her life with Helen. An understanding of the severe chronic pain associated with trachoma, and the rudimentary treatments Annie Sullivan endured over the years, gives any actor playing Annie further insight into her depth of character and extraordinary strength of will.

CHAPTER VI

TUBERCULOSIS OF THE HIP

Boy's Voice: Where we goin', Annie?

Annie: (In dread.) Jimmie.

Boy's Voice: Where we goin'?

Annie: I said—I'm takin' care of you—

Boy's Voice: Forever and ever?

Man's Voice: Annie Sullivan, aged nine, virtually blind, James Sullivan, aged seven—

What's the matter with your leg Sonny? —The Miracle Worker, Act I

James Sullivan, at the age of seven years, was in the alms house in Tewksbury, Massachusetts, with his older sister Annie when he died of tuberculosis of the hip, an excruciatingly painful, degenerative, infectious disease, that, without treatment, renders the joint useless. Like so many other illnesses in the mid-19th century, there was no effective treatment available.

James, or Jimmie as he was called by family, was born January 14, 1869, to Thomas and Alice (Cloesy) Sullivan. The couple had immigrated from Ireland somewhere around the year 1860. While the exact dates of their arrival are unknown, it has been established that they immigrated from Limerick and knew each other prior to their departure (Nielson 4). It's very possible that Alice Sullivan was tubercular before

she left Limerick; the infection was as common in Ireland as it was in the U.S., and in the years between 1800 and 1870, one out of every five deaths were caused by tuberculosis. In the 19th century, “The Captain Among These Men of Death,” as the disease was nicknamed, was epidemic in Europe and North America (Daniel). She may also have been infected during her boat passage to America; another common occurrence. The disease was so prevalent among Irish immigrants in the mid-1800s, Boston health officials blamed the Irish for the disease (Braddy 7, 8). Regardless of when or where she became infected with the bacteria, Alice Sullivan had been told she was tubercular before she became pregnant with their first child (5).

Tuberculosis is transmitted by direct infection from contact with a tuberculous individual (Walters, Vol. II 42). It is highly contagious. James Sullivan may have been infected in utero; family accounts suggest that he was already infected as an infant (Braddy 5). Most instances of tuberculosis of joints are found in children between the ages of three and five years (Walters, Vol. II 42).

Tuberculosis of the hip has the same pathology as any other form of tuberculosis, including the more familiar pulmonary strain. It begins when the individual is infected by the tubercular bacilli. Once the bacilli are deposited, the nearby cells proliferate and form a wart-like nodule called a tubercle. As the infection progresses, the bacilli multiply and spread to new areas, forming new tubercles. These satellite tubercles eventually coalesce as the area of infection enlarges. In a case of tuberculosis of the hip, the spread of bacilli and growth of tubercles causes erosion of the bone of

the joint, and the joint begins to change. The bones become positioned incorrectly; they may misalign or completely dislocate, the ball of the joint corrodes, shrinks and floats freely in the socket. The bones also become weaker and more fibrous, allowing for the bacilli to penetrate the bone and spread more easily. The speed with which the disease spreads depends on the strain of bacilli (some are more virulent than others), and the natural resistance of the patient (42).

Tuberculosis of the hip in children advances rapidly, with an immediate onset of symptoms, including pain that radiates outward from the hip, down the leg and into the knee. This is because the bones of children are soft and porous and easily invaded by the bacilli. Other symptoms include muscle atrophy, muscle spasms or muscle rigidity. The pain caused by these symptoms often woke children from their sleep, or prevented sleep altogether. By the time Jimmie was five he “was on a crutch, and the bunch on his hip, which was about the size of a teacup seemed to be growing bigger; he was pale and thin” (Braddy 15). The “bunch” was most likely a mass, not unlike a cancerous tumor, made up of an abscess that formed around dead tissue under the surface of the skin. It could also have been general swelling around the affected joint.

In the early part of the 19th century, tuberculosis of the hip was easy for doctors to diagnose because, most often, by the time a patient sought the help of a physician, the disease was in advanced stages. Doctors could make a diagnosis the moment a patient limped into the examination room.

Nowhere in any documentation or in Annie Sullivan's personal accounts is it mentioned that James Sullivan's family ever sought medical help for him. It was most likely understood that there was nothing to be done. Doctors in the early 1800s might try bloodletting or purgings, but most simply advised patients to get fresh air and eat well. Even until the early to mid-20th century, before an antibiotic was developed, the only treatment options available for TB of the hip were light therapy, proper hygiene, fresh air and a well balanced diet (Walters, Vol. II 45). In a few cases, surgical and non-surgical measures were used to immobilize the affected joint to prevent further deformity.

As late as 1954, Hugh Smith, M.D., assistant professor of orthopedic surgery, University of Tennessee, wrote that the prognosis for recovery from TB of the hip "with a practical degree of function is unfavorable and is theoretically possible only when the process is arrested and encapsulated before the joint is invaded" (45). It rarely happened. Regardless, death from TB of the hip was unusual, especially in children, unless it was complicated by secondary infections, or the the bacilli had spread to the cerebral and spinal centers. If the infection was caught early enough, and if the patient had access to fresh air, good food and water and good hygiene, children usually had a better chance of surviving without lasting deformity than adults did (46).

Jimmie Sullivan arrived at Tewksbury on February 22, 1876, and died three months later. It's probable that his rapid decline was a result of the deplorable conditions in the alms house. In May, the month Jimmie died, 21 residents died. In that

year, 228 died; 208 of them, like Jimmie, had been there less than a year; 99 of them (almost half), were children under the age of six (Nielson 19). Even fifty years after his death, Annie Sullivan could recount the events surrounding the death of her brother in detail. She remembered that one morning she was helping him dress and he began to cry. The woman in the next bed complained that he had had “a bad night” and had kept her awake. Sullivan remembered, “It seemed to me that Jimmie tried to stand up by his bed but couldn’t. He fell backward and screamed terribly.” A staff member came and took off his clothes. He pointed to “the bunch on his thigh, which seemed larger than I had ever seen it. He kept saying over and over, “It hurts, it hurts” (Braddy 26).

Over the next several days, a doctor attended to Jimmie, and at one point, put his hand on Sullivan’s shoulder and said, “Little girl, your brother will be going on a journey soon.” She inferred his meaning immediately, “more from the sound of his voice than from his words” (26).

The loss of her brother haunted Annie Sullivan long after she left the Tewksbury alms house; playwright William Gibson illuminates her lingering grief in the text of *The Miracle Worker*. The character Annie says, in act I, “I crawled in here like a drowned rat. I thought I died when Jimmie died, that I’d never again—come alive. Well, you say with love so easy, and I haven’t loved a soul since and I never will, I suppose” (17). Sullivan was a witness to Jimmie’s suffering and death from tuberculosis of the hip before she was eleven years old, and that experience scarred her. Understanding what she witnessed provides perspective for the actor playing Annie Sullivan.

CONCLUSION

This dramaturgical analysis is an in depth examination of areas of science that impact the story; language, pedagogy and 19th century medicine, providing insight into these specifics and a deeper appreciation for the life and accomplishments of Helen Keller, and even more importantly, Annie Sullivan. It is helpful to know how Helen's doctors would have treated her illness. It is important to know who Laura Bridgman and Samuel G. Howe were, because, without them, the play would never have been written. But in the end, there is perhaps one central theme; and that is that Sullivan was extraordinary. As a twenty-year-old first-time teacher, she instinctively understood and appreciated the sophisticated concepts of language acquisition that Harvard professors still research and attempt to quantify today. She eclipsed the achievements of her world famous predecessor Samuel G. Howe in the development of pedagogy for the blind and deaf. She ignored the blinding and painful symptoms of trachoma, the eye disease she endured from the age of seven. She moved on from the haunted past of the Tewksbury alms house; where she watched her seven-year-old brother Jimmie suffer, and eventually die, from tuberculosis of the hip. William Gibson conveys her spirited resolve through his dialogue. In Act III, James Keller advises Annie to save herself the trouble with Helen: "Sooner or later we all give up, don't we?" Annie answers, "Maybe you all do. It's my idea of original sin" (66).

The story of Annie Sullivan and Helen Keller is a powerful, emotional story of love and perseverance that transcends time, and somewhere, right now, a theatre is most likely producing *The Miracle Worker*. If this document enriches that production, it has accomplished its objective.

WORKS CITED

- Allexan, Sarah; Byington, Carrie; Finkelstein, Jerome; Tarini, Beth. "Blindness in Walnut Grove: How Did Mary Ingalls Lose Her Sight?" Gateway. January 2013. Web. 5 Nov. 2015.
- Angier, Natalie. "From the Minds of Babies." The New York Times. 30 April 2012. Web. 25 June 2015.
- "A World Without Words." Radiolab. Minnesota Public Radio. WNYC. 9 Aug. 2010. Radio.
- Bell, James; Hansell, Howard. A Manual in Clinical Ophthalmology. Philadelphia. P. Blakiston, Son and Co. 1892. Print.
- Braddy, Nella. Annie Sullivan Macy: The Story Behind Helen Keller. Garden City: Doubleday, Doran and Company. 1934. Print.
- Broks, Paul. Into the Silent Land: Travels in Neuropsychology. New York: Grove/Atlantic, Inc. 2003. Print.
- Bruce, Robert V. Bell: Alexander Graham Bell and the Conquest of Solitude. Ithaca. Cornell University Press. 1973. Print.
- Castillo, Michelle. "Brain Infection, Not Scarlet Fever, May Have Caused Mary Ingalls' Blindness." CBS News. 05 February 2013. Web. 06 Nov. 2015.
- Cheney, Ednah D. Louisa May Alcott, Her Life, Letters and Journals. Boston, M.A.: Roberts Brothers. 1889. Print.

- Daniel, T.M. "The History of Tuberculosis." U.S. National Library of Medicine. National Institute of Health. 06 Sept. 2006. Web. 03 Mar. 2016.
- Fernyhough, Charles. A Thousand Days of Wonder: A Scientist's Chronicle of his Daughter's Development. New York: Penguin Group, Inc. 2008. Print.
- Fox, Webster I. A Practical Treatise on Ophthalmology. New York and London: D. Appleton and Company. 1910. Print.
- Freeberg, Ernest. Laura Bridgman: First Blind and Deaf Person to Learn Language. Cambridge, MA: Harvard University Press. 2001. Print.
- Gibson, William. *The Miracle Worker*. New York. Samuel French. 1956. Print.
- Gitter, Elisabeth. The Imprisoned Guest: Samuel Howe and Laura Bridgman, the Original Deaf-Blind Girl. New York: Farrar, Starus and Giroux. 2001. Print.
- Herrmann, Dorothy. Helen Keller: A Life. New York: Alfred A. Knopf. 1998. Print.
- Hall, Florence Howe and Maud Howe. Laura Bridgman: Dr. Howe's Famous Pupil and What He Taught Her. Boston: Little, Brown, and Company. 1904. Print.
- Howe, Samuel Gridley. Eighteenth Annual Report. Perkins Institute. Boston. 1850. Print.
- Jourdain, Margaret. Diderot's Early Philosophical Works. Chicago and London: The Open Court Publishing Co. 1916. Print.
- Kasper, D., et al. Harrison's Principals of Internal Medicine: 19th Edition. New York: McGraw-Hill Education. 2015. Print.

Keller, Helen. Teacher: Anne Sullivan Macy. Garden City, N.Y.: Doubleday and Company, Inc. 1956. Print.

---. The Story of My Life. Garden City, N.Y.: Doubleday and Company, Inc. 1903. Print.

---. Midstream, My Later Life. Garden City, N.Y.: Doubleday, Doran. 1929. Print.

Lane, Harlan. The Wild Boy of Aveyron. Cambridge, M.A.: Harvard University Press. 1976. Print.

Lamson, Mary Swift. The Life and Education of Laura Dewey Bridgeman, Deaf, Dumb, and Blind Girl. Boston, M.A.: Houghton Mifflin and Company. 1895. Print.

Lash, Joseph. Helen and Teacher: The Story of Helen Keller and Annie Sullivan Macy. New York. Delacourt Press. 1997. Print.

Luria, Alexander Romanovich. The Man with the Shattered World: The History of a Brain Wound. New York: Basic Books. 1972. Print.

McGinnity, Betsy L., et at. "Laura Bridgeman." Perkins History Museum. Perkins School for the Blind, Watertown, M.A. Web. 2004. 03 March 2015.

Nielson, Kim E. Beyond the Miracle Worker: The Remarkable Life of Annie Sullivan Macy and Her Extraordinary Friendship with Helen Keller. Boston, M.A.: Beacon Press. 2009. Print.

Richards, Laura E. Laura Bridgman: The Story of the Open Door. New York: D. Appleton and Company. 1928. Print.

- Richards, Sarah. Letters and Journals of Samuel Gridley Howe During the Greek Revolution. London: John Lane. 1907. Print.
- . Letters and Journals of Samuel Gridley Howe, Volume II. Boston, M.A.: Dana Estes and Company. 1908. Print.
- Schaller, Susan. A Man Without Words. Berkeley: C.A.: University of California Press. 2014. Print.
- Schweigger, C. Translated from the German by Farley, Porter. Ophthalmology. Philadelphia, P.A.: J.B. Lippincott and Co. 1878. Print.
- Simon, Neil. *Lost in Yonkers*. New York: Samuel French. 1991. Print.
- Smith, Tara C. "Scarlet Fever Past and Present." *Aeitiology*. Science Blogs. 6 July 2011. Web. 20 Feb. 2016.
- Sullivan, Annie. "Foolish Remarks of a Foolish Woman." *Winnipeg Free Press*. 21 Oct. 1936. American Federation for the Blind. Web. 05 June 2015.
- Tilney, Frederick, A. "Comparative Sensory Analysis of Helen Keller and Laura Bridgman." *Archives of Neurology and Psychiatry*. Eugenics Research Association. Lancaster, P.A.: Lime and Green Streets. 1928. Print.
- Ulrich, Laura Thatcher. A Midwife's Tale: The Life of Martha Ballard, Based on her Diary 1785-1812. New York. Vintage. 1990. Print.
- Walters, Waltman. Lewis' Practice of Surgery, Volume II. Hagerstown, M.D.: W.F. Prior Company, Inc. 1955. Print.

---. Lewis' Practice of Surgery, Volume IV. Hagerstown, M.D.: W.F. Prior Company.

Inc. 1955. Print.

Wilder, Laura I. By the Shores of Silver Lake. New York. Harper and Brothers. 1939.

Print.

"Words That Change the World." Radiolab. Minnesota Public Radio. WNYC. 09 August

2010. Radio.