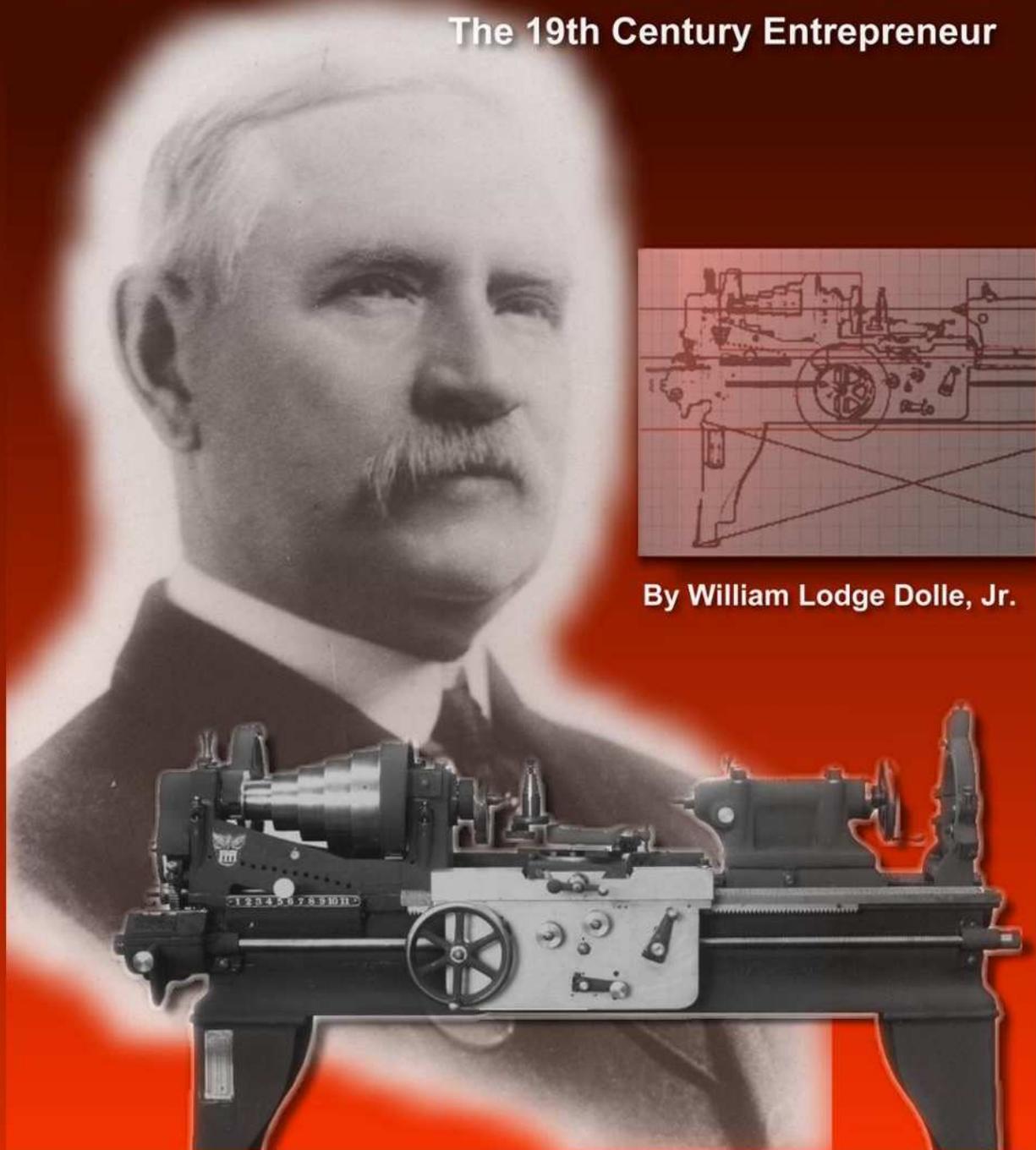


# WILLIAM LODGE

The 19th Century Entrepreneur



By William Lodge Dolle, Jr.

## About the Author



William Lodge Dolle, Jr.\*

William Lodge Dolle, Jr. was the great grandson of William Lodge and the former CEO of Lodge & Shipley from 1966 until its liquidation in 1987. Due to his heritage, his access to historical data and family lore, he was particularly well-qualified to write this book. His previous book *Pearl Harbor Springs* (1991) dealt with the role of the Japanese in the demise of the American machine tool industry. William Lodge Dolle, Jr. died on 5 March 2003 after a long bout with cancer. He was 74 years old.

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\*Sketch from a December 1976 photograph commemorating the shipment of a CNC lathe to the WM Powel Company of Cincinnati, the 50,000th machine tool manufactured in Lodge & Shipley's history.

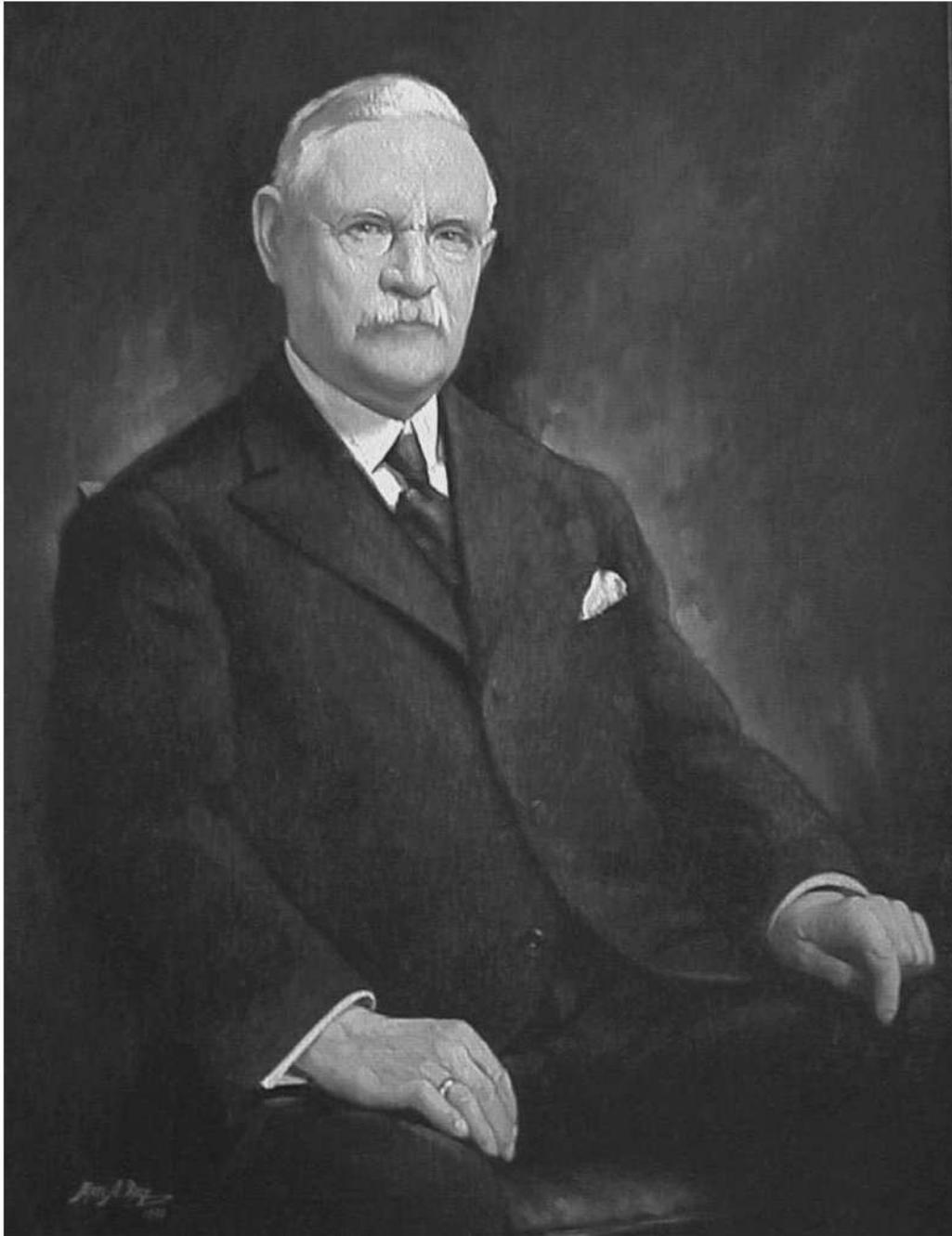
# William Lodge

## The 19<sup>th</sup> Century Entrepreneur

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Early in the 20th century, Cincinnati had earned the title "machine tool capital of the world", since more than two-thirds of the machine tool firms in the country were concentrated within a 100 mile radius of the city. While much has been made of this fact, of greater significance is the impact that these companies had on the industrial development of the country and the amazing entrepreneurial spirit that led to their creation against all odds. One of the leaders of this group of machine tool entrepreneurs beginning in 1880 was William Lodge, who had a profound impact on the industry over the next 30 years. This historical narrative attempts to bring William Lodge to life during that period to give us a better understanding and appreciation of the 19th century entrepreneur.



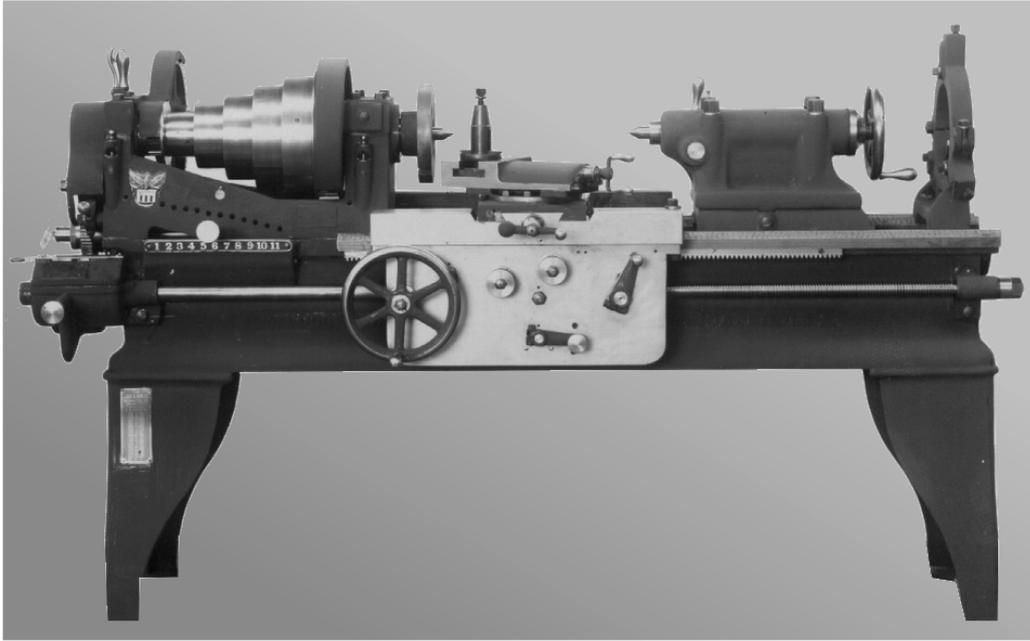
Painting of William Lodge by Matt Daly

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Early cone head engine lathe (c. 1890)

## Preface

At the beginning of the 20th Century, there were 30 well-established machine tool firms in the Cincinnati area employing over 3000 workers, which earned the city its well-deserved reputation as "the machine tool capital of the world." The impact that these 30 companies had on the industrial development and success of the Nation was comparable to the role of Silicon Valley later in the century.

The origin of most of these companies began about 1860 with the John Steptoe Company in Cincinnati, one of the earliest of the machine tool firms in the midwest. The need of the market in those years was primarily driven by the rapid expansion in river and railroad transportation, that in turn necessitated the manufacture of steam engines, boilers, and a rapidly growing array of other metal devices to power these creations. Machine tools were essential to the manufacture of the steel and cast iron parts from which the assembled units were made. Cincinnati quickly became one of the leading centers for the manufacture of river boats and canal barges, that were more important than railroads to commercial transportation at the time. And it was the formation of so many machine tool firms in the area that made this possible.

The founders of these Cincinnati machine tool firms were truly entrepreneurs - before the word was even coined - although they lacked the highly developed venture and stock market capital that fueled Silicon Valley. Had these companies had the same access to the almost unlimited capital available to startup companies today, there is no telling how large some of them may have become. In the absence of that kind of capital, most of the founders risked everything to chase a dream. One of these entrepreneurs was William Lodge, who was not only the founder of three companies in the 1880 to 1892 period and later the cofounder of the National Machine Tool Builders Association, but was also the mentor of a dozen or so individuals who went on to start their own firms.

William Lodge was born in Leeds, England in 1848, and completed his shop apprenticeship there before moving to Philadelphia in 1869, where he spent three years with the Chambers Brothers, a

manufacturer of paper-folding machinery. In 1872, he moved to Cincinnati and spent the next eight years as a journeyman machinist and then foreman with the John Steptoe Company, which manufactured a variety of machine tools and woodworking machinery. He married Mary G. De Rose in 1873, and had a Daughter Augusta in 1874 and another daughter, Mary Felicia, in 1877. By the time he had formed his first company in 1880, he was only 31 years of age, which was unusual at the time but quite typical for the computer software and internet era of the later 20th century.

From numerous articles, published works and family lore it has been possible to construct this historical narrative on the life of William Lodge during the years of 1872 to 1910, in the hopes that we can more fully appreciate the challenges and the life style of a 19th century entrepreneur.

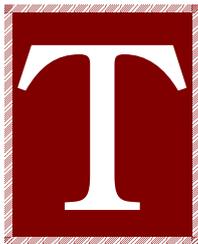
Before moving on, it is important to recognize that prior to 1870, the most significant developments in the world of machine tool technology had taken place in just two countries - England and the U.S. The French made a start at it in the 18th century, but it never went anywhere. The Swiss were more interested in miniaturization for the coming watch industry, and the Germans were just entering their industrialization phase under the Bismark era. So, the British and Americans were in a leading position in terms of machine tool development and the implementation of the technology to manufacturing in general. It would have been a tragedy if the Americans did not take advantage of this opportunity.

Finally, some management and human behaviour authorities, such as B.F. Skinner, say that every successful company requires a combination of leaders with three basic talents - "a reamer, a dreamer, and a schemer." These three characteristics are rarely present in just one individual. William Lodge was exceptional in that he had an abundance of the first two. However, a "schemer" he was not, which led to the business reversal herein described in Chapters six and seven - a set-back that only the most resolute person could overcome.

# I

## In the Beginning...

Cincinnati, Ohio  
Wednesday, September 11, 1872



he stark waiting room was reminiscent of the small train station outside of Leeds, England, the principle furniture being a long wooden bench that may have been constructed from an old shipping crate. On a small end table there was a pencil and some scrap paper, along with a notice that read:

*Print your name, the company employee you wish to see, slide inquiry under the door, and knock.*

Fortunately, he didn't have to wait more than about 20 minutes when he was beckoned by a middle age woman, who reminded him somewhat of his mother. He was also struck by how unusual it was to see a woman working in a machine tool company.

"Mr. Lodge. Mr. Steptoe will see you now."

She led him down a narrow hallway to a dark office, one that was quite typical for a manufacturing establishment of its time.

"Well, he was here a moment ago," she said. "Please have a seat and I will see if he went to the drawing department".

At that moment, John Steptoe appeared in the doorway.

"Welcome to Cincinnati, Mr. Lodge. I received your post a week or so ago, and I presume that is why you are here."

Lodge was somewhat taken back by the age of Steptoe, which he estimated to be about 70.

"Yes, sir. I am hopeful that there may be position available here for a skilled mechanic."

"Well, we can talk about it. I see from your letter that you apprenticed at Fairbairn in Leeds. Mr Fairbairn is an old acquaintance of mine since I came originally from Oldham, not too far away. Would he speak highly of you?"

"I would hope so, Sir"

"And then, when you arrived in America, you worked three years for the Chambers Brothers in Philadelphia. Why would you leave them so soon?"

"Because of my desire to become engaged in the manufacture of machine tools, which is both interesting and a fine opportunity. There are no machine tool firms in Philadelphia. Chambers made paper handling machines. I spent a few weeks in St Louis, but there are no firms there either. Too far west I suppose. So, here I am in your picturesque city."

While this was a fairly true explanation, Lodge had no intention of revealing that he had a not too pleasant disagreement with his foreman at Chambers that led to his sudden departure from that firm. This was so uncharacteristic of Lodge's jovial personality that he was determined to keep the issue behind him. The dispute arose because the foreman, who was Serbian, had promised Lodge that he would help him secure a pay raise, when he in fact, wanted him fired because he viewed Lodge as a threat to his own job.

"Aren't you rather young to be doing all this moving around, Mr. Lodge?"

"I'm 24, going on 25. Life is short, so one has to get started early to make the most of it."

"Alright, let's take a few moments to walk through the shop. Just follow me."

Steptoe led the way through another hallway and into the shop. Lodge was impressed with the size of the shop building, and said quietly, "Oh, my." He could feel that his heart was pumping quickly, and knew immediately that this was the shop for him. He followed Steptoe through the shop floor to an area where a dozen men were busy machining parts and assembling several machines that stood about waist high.

"Tell me, Mr. Lodge, what do you think we're doing here?"

"Well, sir, it looks like you are making some kind of a milling machine."

"You are correct. These are for a nice order we received from the Springfield Armory. The design is ours, slightly modified to mill small gun parts."

"I'm a little familiar with that arsenal, since I considered working for them before. I was engaged by Chambers. They have done some unusual work in interchangeable parts for Army rifles."

"You are an informed person, Mr. Lodge."

They left the area and moved on to another department where some 18 men were involved in various tasks. Lodge exclaimed quickly, "These are lathes of various sizes that you are building here?"

"Right again. And this is the department where we could use another man. Do you think you could do this work?"

"Oh yes, sir, and I could start tomorrow."

"Next Monday would be soon enough. Let's now go back to my office and put this in writing."

Returning to Steptoe's office, he closed the door, pointed to a chair, and said, "Where are you now living, Mr. Lodge?"

"In a flop house down near the river the past few weeks. I was doing temporary work loading barges."

"Well, now you should be able to find something more permanent and private. Perhaps our men here may have some suggestions for you. I have in mind to start you out at 25 cents per hour, slightly more than our usual starting rate because of your experience. Does that sound alright?"

"Yes, sir!"

"Our hours here are 7am to 5pm, with 30 minutes for lunch at noon. And stay out of the saloons at lunch time! Come to the back receiving door on Monday before 7 and ask for William Barker, who is an assistant to the foreman of the lathe building department. He will get you started. Now, let me get my daughter, Elizabeth, in here to document this."

When Elizabeth entered the office, Steptoe said, "Mr. William Lodge here will begin working in our lathe building department on Monday, September 16. I will arrange for Will Barker to get him started. Let's give him \$4.50 now, his pay for the first two days, so that he can buy a few clothes, and be well-fed when he reports for work. He is presently living in a temporary residence, so when he finds a more permanent place he will let you know so you can note it in our payroll records."

"So, Mr. Lodge, we will see you on Monday. Follow Elizabeth and she will get that advance for you. Oh, by the way, what given name shall we use to address you?"

"My family and close friends usually call me Billy."

"So, Billy it will be," exclaimed Steptoe.

Things had moved so quickly - in less than an hour since he arrived - that Lodge was almost speechless, as he babbled out,

"Thanks so much, Mr. Steptoe. I am certain you will be pleased with my work."

"Well, we surely hope so, Billy. We have a great reputation to uphold, and you will find that we have the finest mechanics in this part of the country."

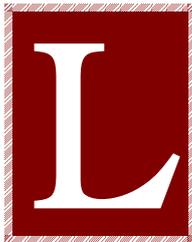
On his walk back downtown, Lodge's short little legs were moving as fast as they could without breaking into a run. He was so excited following the interview that he felt like he was walking on air. The Steptoe Company was exactly what he had in mind when he moved to America - a well-established firm which manufactured a variety of machine tools and other types of machines; an English heritage; and, apparently, some excellent mechanics that could further his own knowledge of the mechanical arts. And he could see that Cincinnati was the place to be due to the large number of firms engaged in the manufacture of river boats and the steam boilers to power them. That should fuel a growing market for machine tools.

Now what he needed to do was a little shopping. Perhaps some new work pants and a shirt, and - oh, yes - maybe an inexpensive watch to replace the one he gave to the locomotive engineer for the ride from St Louis. He also knew that over the next two days he needed to work on the docks again, even though the pay was less than \$1.50 per day, because this would assure him that he wouldn't go hungry until he received his next pay from Steptoe, probably not before a week from Friday. The thought of another two days on the landing didn't bother him because he was so excited about starting his new job after the weekend.

## 2

### Work and Pending Marriage

Monday, September 16, 1872



Lodge arrived at the back receiving door of the Steptoe shops as instructed, although he was a good thirty minutes early. The day was quite pleasant so he did not mind the wait outside the door. Soon, the workmen began arriving and it gave him a chance to study each of them as they passed by. He could tell from their features and the way they were dressed that some were of English background, but many more appeared to be of German descent. Shortly he was approached by one of them who asked, "Can I help you, mister?"

"Yes, I am looking for Mr. William Barker."

"You're looking at him. And I go by the name Will Barker. I suppose you're William Lodge?"

"Yes, sir. And I go by the name Billy."

"Welcome to the Steptoe Company, Billy. Just follow me and I will give you a complete tour of the shop before I set you up in our lathe building department."

Lodge dutifully followed Barker, who explained the function of each department as they moved along. It was quite interesting to Lodge, and a much more detailed tour than the one given by John Steptoe the previous Wednesday. After an hour or so and numerous questions by Lodge during the tour, they arrived at the lathe building department.

"Here we are, Billy. This will be your work station for what we hope will be many years. I'll introduce you to the men in your department, but don't feel bad if you can't connect all the names and

faces the first time through. I think you will find most of them to be very helpful."

After some fifteen individual introductions, Barker looked over the area and said, "Let's see what your first task should be to get you started. Have you ever fitted up a tailstock unit to a lathe bed?"

"Oh, yes, sir. At Fairbairn in Leeds I did. It's been over three years, but I think it will come back to me. That was on a modified version of the Putnam design - not too different from what you have here."

"Good. Then you can get started on this one and I will check back with you later."

Lodge became so engrossed in his work on the tailstock that he would have forgotten about lunch if Barker had not come by. "Come on, Billy, and I will take you to my favorite place for lunch, at your own expense, of course."

Lodge smiled and nodded, "You're the boss." He followed Barker down the shop aisle toward the door.

They had only walked a block or so when Lodge noticed a group of men standing at the next corner. "Here we are. My favorite place on a nice day. Have you ever heard of the Wiener Wurst Man? There he is," as Lodge noticed a huge man of obvious German descent with a very large wicker basket. "Best sandwich in town, and quite inexpensive," exclaimed Barker. "And it keeps us out of the saloons as ordered by Mr. Steptoe."

After selecting their wienerwursts the two of them made use of a bench by a trolley stop so they could enjoy their sandwiches and the sunny September day. "I understand you are looking for more permanent living quarters, Billy? Some day after work let me introduce you to one of the workmen from our pattern shop. I understand he may have a spare room in the house that he rents."

"I would really appreciate that, Will."

Lodge continued working enthusiastically on fitting the tailstock that afternoon and into the next day, aside from helping several of the other men in the department with various tasks. Later that day Will Barker came by and introduced him to a new face. "Billy, this is John DeRose. He works in our pattern shop and knows of a room for rent near his house in Mt. Adams, so I'll let the two of you work that out."

"Pleased to meet you, John. And thanks for bringing him by, Will. I can't wait to get out of that flop house."

Lodge was a little puzzled by John DeRose at first. He had seen so many German, Irish, and English heritage people in the city that he

was surprised by someone with black hair and darker skin. Maybe of Spanish decent, he thought.

"Billy, I think you would be pleased with this room that my neighbor has for rent. You probably are not familiar with the city yet, but this is up in Mt. Adams on Observatory. It is quite a walk up the hill from here, but it is easy going down in the morning. When would you like to see it?"

"I could go this evening after work if that is convenient for you."

"Fine. I will meet you outside the shop door and we can go up together. See you later."

After the 5PM whistle blew Lodge hurried to the door and promptly saw DeRose waiting for him as agreed. "Lets take the 5th Street trolley to the base of the hill. There is a bit of chill in the air this evening, and this will help you find your way in the future."

Lodge would have preferred to walk and save the 5 cents for the trolley, but he thought it best to agree with his host, and perhaps even his future landlord.

"So, Billy, how long have you been in America?"

"It's been over three years now. Most of that time in Philadelphia. But Cincinnati looks like the place for me. I am really enthused about the potential opportunities in machine tool manufacturing. And with all of the metal working shops around here as possible customers, the future could be quite good. And you?"

"Not a year yet. My parents have been here for five years or so, but I was completing my cabinet makers apprenticeship in the Azores."

"How did you come by a house so quickly?"

"With the help of my parents. The house is not just for my use. My sister, Mary Gloria, is moving down from Pomeroy, Ohio, and we will share it together. There are a lot more work opportunities for her around here than up river."

"That sounds like a good financial solution - sharing a house with a sister. But what happens if one or both of you marry?"

"Fortunately, the house is big enough for two families. I'll give you a visit after we look at your room. This is as far as the trolley goes, Billy. We just walk up the hill from here."

After several blocks walk, DeRose paused and said, "Isn't this some kind of view from here?" Lodge nodded in agreement, as he noticed a house with a "room for rent" sign.

"Is that where we are going, John?"

"Yes, but let me first make sure that Mrs. Schmidt is available. Oh, I think I see her by the side of the house now..."

"Mrs. Schmidt! I have someone with me who could be interested in the room you have available."

"That's fine, Mr. DeRose. Let me finish cleaning up here and I'll be right with you."

Momentarily she approached the two of them and commented, "What do we have here... another mechanic?"

"Yes, Mrs. Schmidt. This is William Lodge - better known as Billy. He is new to town and recently came to work at Steptoe. Now he needs a nice room."

"Well, lets see if I can be of help. Just follow me please", as she led them into the house. Lodge judged her to be maybe 60, and of obvious German descent, so it didn't surprise him when he detected the odor of sauerkraut as soon as he entered. She led them down a hallway and into the room that was available.

"Perfect," he said loudly, and then realized he gave up any opportunity to negotiate.

"I try to keep it nice and I would hope you do the same. It's available beginning this Saturday at a rate of \$3.00 per week. Is that satisfactory?"

"Oh, yes, Mrs. Schmidt," as Lodge tried to contain his enthusiasm.

"You didn't ask about a bathroom, which is just down the hall. And you are permitted to use the kitchen after 6pm and before 6am. So, we do have running water and gas, but no electricity yet."

"Everything is wonderful, Mrs. Schmidt. You have more modern amenities than I am accustomed to. We won't take any more of your time now. I will see you about noon on Saturday."

"That would be fine, Mr. Lodge. I will have a house key for you at that time. And if you don't mind, I would appreciate your first week's rental on Saturday."

"That was to be expected, Mrs. Schmidt," he said, knowing full well that he was already paying 50 cents per day in the flop house with very little privacy, so he would actually be saving that much every week. And, he knew he would get paid on Friday, but it still might mean missing a meal or so the following week until he caught up.

DeRose and Lodge moved on for a look at his house close by. After several minutes inside and viewing the upstairs as well, Lodge exclaimed, "This is really a wonderful house. I presume your sister will take the upstairs and you will stay where you are on the first floor."

"Correct, Billy. That seems to be the best arrangement. Women seem to appreciate a little more room."

"I wouldn't know. I only had one sister and she was much younger. Well, it's time for me to move on. I appreciate your help in finding the room. But I have a question before I leave. You saw that lathe tailstock I was working on today? Would it be possible to modify the casting by taking a couple inches of iron from under the barrel on the front and maybe supporting it with a rib or more metal on the rear? In that way it would allow for the compound to be angled parallel to the lathe center line for better boring".

"Billy, it so happened that I made the pattern for that tailstock. I could modify the pattern as you suggest, but you may need to talk to a foundryman to see if it would loose any load capacity. The design is Mr. Steptoe's so one has to be rather careful calling into question any failings of the boss."

"It's really not a failing. More of an improvement on a present design. I'll think some more about it. Thanks again, John. Have a good evening."

Lodge made his way down the hill to town with supreme satisfaction that he had found a nice place to live, that would certainly please even his mother. He could now write her of his good fortune in finding a great job and a place to live. It had been several months since he had written. If he had time, he might also do a little sketching on that tailstock to see what the possibilities looked like on paper.

For the next fortnight Lodge settled into his new living quarters and his job. And by skimping on meals and occasional beers, his financial situation was now a little more comfortable than before. He also wrote his mother a long letter as he had promised, and sketched some designs for a revised tailstock, which he folded up and kept in his back pocket just in case he should see Mr. Steptoe in the shop at any point.

One day as he was about to leave for lunch he saw Steptoe coming down the aisle.

"Mr. Steptoe! Mr. Steptoe, would you have a few moments?" He reached into his back pocket and pulled out the sketches.

"I was working on this tailstock and it ocured to me that with a minor casting change the design could be improved that would allow the compound to be angled parallel to the lathe centerline. It could really improve the boring capabilities of the lathe. Steptoe studied the sketches carefully, then looked Lodge in the eyes.

"Mr. Lodge, maybe we should move you up to our drawing room."

"Sir, I'd prefer to stay here. I love the shop, and I'm afraid I would go crazy at a drawing board all day."

"Well, you keep thinking, and bringing me your ideas. We value employees who do more than just their assigned job. Is it alright if I keep these sketches? They are rather creative."

"Yes, sir. They're for you. Thank you for your time, sir."

This brief conversation with Steptoe was burned permanently in Lodge's memory, particularly his comment that he valued employees who did more than just their assigned job. He was even more satisfied when on Friday of the following week he was quite surprised to see that he had received a raise of 10 cents an hour.

Several weeks later after departing his house in Mt. Adams, he saw John DeRose just ahead, who appeared to be waiting for Lodge to catch up.

"Good morning, John. What is the good word this morning?"

"How can you always be so happy all day long?"

"I guess I was born that way, John. But I do love life."

"Well, maybe I can make it even better. Would you be interested in meeting my sister Mary Gloria? She is just about your age. What I thought we could do on Sunday, if it is a nice day, is pack a lunch and go the park. If the day is cold or rainy you can come over to my place for lunch about noon."

"That sounds wonderful, John. My mother is certain to ask if I have met any nice ladies yet. I will look forward to Sunday."

Actually, Lodge was both excited and apprehensive about this invitation from DeRose. It had been some time since he had any social interaction with a young lady his age. How was he to act? What could they talk about? Certainly not about mechanics. But maybe about living in America, the weather, or perhaps world news if he could take the time to read a newspaper in the next few days.

Sunday came sooner than expected, because he was busy, and it turned out to be a great October Indian summer day. He walked over to DeRose's house, and was greeted at the door by an attractive young lady.

"You must be Billy. I am John's sister Mary Gloria."

After an agonizing moment of silence, he uttered, "Hi, pleased to meet you! I'm Billy."

"John is in the kitchen working on our lunch. He says there is a nice grassy area below the church where we can spread out a blanket and enjoy the sun and the view. Does that sound good?"

"Perfect. Isn't this weather someting?" Lodge asked cautiously, realizing that he already used up one of the few planned subjects of conversation.

Shortly, the three of them headed out to the area on the hillside that DeRose selected. John led the way as he kept the conversation going, sensing that Lodge was almost overcome with speechlessness. During their lunch, he encouraged Lodge to talk about his youth and family in England, and he noticed that Mary Gloria listened very intently to his every word. By the time lunch was over, and still more conversation, he could almost sense a certain excitement between his sister and Lodge. For the first time in his memory, Mary was exhibiting a sparkle in her eyes that he had never seen before. He thought to himself, "was this an overreaction to her first meeting with an eligible man her age in some time, or was there some unusual attraction between the two that he couldn't put his finger on?"

The romance between William Lodge and Mary Gloria DeRose continued to blossom over that winter of 1872/73, and into the fall a year later. Living just a few streets apart certainly made it convenient, so there was hardly a weekend that they were not together. They frequented the theaters and museums - places that Lodge was largely unfamiliar with. Mary had been raised with a high degree of social grace, which greatly influenced Billy and contributed to his later success.

Lodge continued to prosper in his work at the Steptoe Company, having been made an assistant foreman, with yet another raise in pay. There were ongoing fears of a postwar business panic. He thought of the few men at Steptoe who were working shorter hours. But reassured himself that orders frequently appeared out of nowhere - especially from the Springfield arsenal. With his finances steadily improving, Mary and Billy decided to marry.

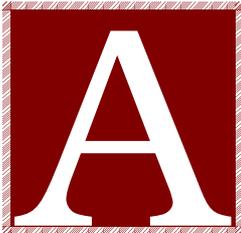
As the fall of 1873 gradually came to a close with the arrival of much cooler temperatures, it occurred to Lodge one day that he didn't own a good suit for the wedding. That weekend he started looking in town in men's shops and was rather startled at the prices, usually in the range of \$6.00 to \$10.00 for a nice suit. Somehow, he came across a second hand shop and was pleased to find a suit for \$3.00. The coat fit perfectly, so he made the purchase and took it home. He went immediately to his room to try on the whole suit. Much to his disappointment, while the coat fit perfectly, the pants were real baggy. With that he heard Mrs. Schmidt in the kitchen, and called out, "Mrs. Schmidt, would you mind looking at something for me?"

Mrs. Schmidt entered the room and said, "Well, it looks like we found a suit for your wedding. Those pants will never do, Billy. Your legs are too short. But, maybe I can do some sewing for you. Just lay the pants on your chair there and I will see if I can get to them in the next few days."

# 3

## Seven Years of Bliss

Wednesday, December 3, 1873



As a newly-converted Catholic, Lodge entered the Immaculata Church close to 6:25pm as instructed. He immediately saw Mary - so resplendent in her wedding dress - that he was almost overcome with emotion, and at the same time oblivious to other people in the room.

Father Sebastian finally broke the silence and discomfort of the group, "It looks like everyone is here now, particularly the beautiful bride and the handsome groom, so we can begin the ceremony. But first, let me take a few minutes to talk about the sanctity of marriage. Mr. Lodge and I had several discussions on the subject, but it seems timely for me to repeat just a little of that before we begin."

From the church the six of them made their way to a small tavern in Mt. Adams to eat and celebrate. They had talked about a more elaborate dinner downtown at the Burnet House, but the evening cold and the cost of the Burnet were a discouraging factor. Also Billy and John were expected at work early the next morning, so they talked instead about a finer celebration downtown Christmas time.

When dinner was over, both Billy and Mary retired to the second floor of John's house for the first time. "What a strange feeling," he thought. "Aside from the typical apprehension of any new couple on their wedding night, I've got to get accustomed to new living quarters - and in my brother-in-law's house." It didn't take him many days, however, to adjust to the change.

Several months into the 1874 year, Lodge returned from work one evening to find Mary waiting for him at the door. He could tell she

had something on her mind but, rather than hurry her, he just acted as though everything was quite normal. He walked into the kitchen, peered into a few pots to see what was for dinner.

"Billy, I have some news for you... We will soon have an addition to our home."

"That's wonderful, Mary! Aren't you happy about it? I know that I am."

"Yes, I'm happy about it. But also concerned. Perhaps if there were not so many people out of work I would not be that way, but I feel so sorry for the unemployed in their tattered clothes and begging on street corners. We should be very thankful that Steptoe has some business and you are still getting paid. But will it last?"

"Fortunately, Mary, Steptoe has such a fine reputation and a good list of customers, that the business is only down about a quarter. Further, Mr. Steptoe is opposed to any redundancies. While we have a large number of people on shorter hours and doing maintenance tasks, every employee is still getting paid. Mr. Steptoe is determined to protect his valued and skilled employees. That should reap benefits when the economy improves."

He pulled the tie from his neck and gazed out the kitchen window at the first buds of spring. "The main reason business is so bad is the result of the huge reconstruction spending in the South following the Civil War. That is now fully completed. Business will eventually recover, but I'm told it could be a few more years yet."

Turning abruptly, he asked, "Will John be with us for dinner tonight? If so, maybe we can open that bottle of wine we have been saving to celebrate the good news."

"That is a good idea. He didn't say that he had any plans. He could even bring his lady, because he knew I was fixing one of his favorite suppers."

Augusta Rose Lodge came into being two days after Christmas in 1874. Fortunately, it was a Sunday when Billy Lodge was home, so he could at least seek out the midwife. It was a difficult adjustment for the Lodges, as any first child is to a young couple. There was even talk for a while about the three of them finding a separate house, which Billy resisted because he could easily calculate how much money they were saving each month by sharing a home with his brother-in-law, John. He was gradually building a savings account, which he considered his "rainy day fund" and he still had this dream of having his own company one day, which he knew would necessitate some kind of capital investment on his part. Greatfully, things had not become any worse at the Steptoe & McFarlan Company. While it had been a while since he had a raise, as an assistant foreman he was not asked to go on shorter hours. John DeRose was also fortunate in that respect. As a skilled cabinet maker, if there was not

enough work in the pattern shop, John was always kept busy building shelves, bins, and cabinets through out the company.

During that time Lodge gradually became more involved with the Mechanics Union, which he really found stimulating because of the interface with other skilled mechanics around the area. And it really gave him a good insight into other mechanic businesses, involving boilers, valves and barges – devices and accessories that would drive the Cincinnati economy in the coming years. It was also a great source of information about the level of future business activity, since many of the orders now in process among the various companies represented were received months ago.

Lodge could not get over how quickly the days and months seemed to pass. One hot summer evening after a gruelling day of work, Billy looked up from dinner and said, "You remember me speaking about my foreman, Patrick? Well, Patrick is planning to retire soon. Seems that he or his wife came into an inheritance. The word is that I am being considered as Patrick's replacement."

"That would be wonderful, Bill. Then, we could afford an addition to the family. Maybe even move into a house of our own."

"I would only move up to a foreman - not general manager. And this is some months away, yet. Anyway, what's for supper, tonight? My stomach says it is nearly time."

"Why don't you just be surprised, Billy?"

About the time of the arrival of Mary Felicia in 1877 things did become more comfortable for the Lodges. Billy was made a foreman a few months earlier, and the Steptoe Company business was finally beginning to improve. As a result, the Lodges were able to increase their "rainy day fund" by \$30-50 every month, which gave both of them a great deal of satisfaction, although for different reasons. For Mary, it was the security in the knowledge that they were building a savings account in the event there really came a rainy day, now that they had two more mouths to feed. For Billy, all that he could think about was the day he would start his own company. And as their savings account began to grow - and the economy improved - he could foresee that day drawing nearer.

The other event that occurred at that time was Billy's nomination as President of the Mechanics Union, which was important to his career development and future success. With his formal education limited to about the 8th grade, this was on-the-job training in skills that he would find valuable in later years.

One spring day the following year, Lodge and Will Barker were having lunch together outside the shop.

"Will, have you thought any more about going into business together?"

"Not seriously, Billy. Why do you bring that up now?"

"For two reasons. The first is that our friends in the Union all tell me that their company's fortunes are improving. One would not want to start a new company on the brink of an economic disaster, but rather on the brink of a recovery. Second, my savings account is now looking well, and I believe that you said yours is also. One must strike when the iron is hot."

"I guess I need to think about it some more. Could you develop some more specific plans for me, such as what kind of business, where would it be located in town and how much capital would be needed."

"Sure, Will. But the first questions you need to answer are: Do you think we would make good partners, and are you prepared to take some risks? Nothing is certain, you know."

"I understand. I am comfortable with your two basic questions, but I would like to see more specifics on the company."

"Good! I will begin to put some ideas on paper, knowing that you have a serious interest."

Will Barker and Billy Lodge had numerous small discussions on this subject for more than the next year. Lodge didn't present any specifics because he sensed that Barker was not ready to make a commitment until he was absolutely certain that the business climate was on the upswing. That certainty came in the fall of 1879 when most of the mechanics in the union were reporting very strong business at their companies.

One day at lunch, Barker said to Lodge, "I'm still waiting for your further thoughts on our company."

"Will, I'm glad you asked. Here is a question for you: What type of mechanical product do the two of us have the most combined experience?"

"I would have to say machine tools, Billy."

"And which machine tool would you say is the most needed?"

"Probably the lathe, since there seems to be so many round parts from metal compared to flat ones."

"Then given our experience - and the opportunities - wouldn't you agree that we should start a company that manufactures lathes and related parts?"

"Probably. At least in the beginning."

"Alright! Here are some figures for you. I calculate that we are each going to need an initial investment of about \$1,000. In my case that still leaves about \$300 in my rainy day account, so that Mary won't become too nervous. After that we should be able to borrow from the bank if we can show profitable growth in the company. There is a 5,000 square foot building available for lease at 602 W. 5th

Street. Take a look at it over the next days and let me know what you think. I have also located three second-hand machine tools for just a few hundred dollars to get us started."

"Billy, you have been holding back on me. You really have put some time into this."

"I didn't think you were prepared until now, Will. Are you sure you're ready to make the decision?"

"If not now, then never!"

"Alright! I suggest we set a date for opening the company on January 1, 1880. That is only about three months from now. We could even begin soliciting verbal orders in advance of that date, after we both talk to John Steptoe about our plans, of course."

"I'm with you, Billy, so don't make any major decisions without me."

"Don't worry about that. You are my full partner, so I will be bothering you with many decisions in the coming weeks. One of the first things we may need to do is have a look together at these used machines. They will likely need some rework, which we can do ourselves, but I think they are a good bargain. And they won't be available too long. We may need to put a few dollars down and ask the owner if he will hold them a few months until we can move them into our shop."

William Lodge and William Barker made the commitment to start their own company, which ultimately would have a profound affect on much of the Cincinnati metalworking industry.

# 4

## Startup of the Lodge & Barker Company

Thursday, January 1, 1880



he factory building was typical for its day, constructed with wood beams and plank siding. It was sturdy enough for a two ton chain hoist, to aid in machine construction, and also sufficient to support an overhead belt pulley arrangement where required. There was just a small office in the corner, which they hoped to enlarge by themselves, to accommodate a book keeper, and later a draftsman. Perhaps John DeRose could assist with the office enlargement.

Barker and Lodge both arrived at their new shop earlier than usual on that first day, surprising each other at the front door.

"Will, I guess the first thing we need to do is start on that Powell order for those metal dies. If you can do that, I will begin working on the used machines that you won't need immediately."

"Will do, Billy. That would be our first revenue into the company and there may be more opportunities after this order."

"That's what I have been told. In fact, I have been working on some drawings for an improved turret lathe for them and Lunkenheimer. That could have good potential."

"Billy, you are always ahead of me."

"I have had an advantage, since I became friendly with several men in the Union who work at Powell and at Lunkenheimer. It's good that the two of us were able to spend the two holidays getting this shop in order and locating material for that first order. And – oh, yes - did I tell you that Charley Brechle may be interested in working for us if we needed him?"

"Charley is a good man, but he is getting along in years. I'm not sure he can still work a full day. That may be why he wants to leave Steptoe."

"We would have to factor that in if and when he starts working for us. The best way to use him may be to have him train younger inexperienced men that we hire. He has a lot of experience building lathes, and I have high expectations that these valve companies are going to place actual lathe orders. They are really getting busy."

"I hope you are right, Billy. They could be an important start to our future."

Billy Lodge was four and a half months shy of his 32nd year, so there was no shortage of energy to go along with this drive to succeed. The following weeks turned out to be rather pivotal for the success of the young Lodge & Barker Company. When the completed dies were delivered to the Powell Co., they placed orders for two more sets. They then were asked by Lunkenheimer to rebuild one of the lathes in their shop. When this machine was returned to the customer and found to be more accurate than when it was new, Lodge & Barker received their very first lathe order - a turret lathe based on Lodge's original concept. Upon delivery of the first machine several months later, they received orders for three more, and the following year delivered a total of eighteen similar lathes to Lunkenheimer and other customers.

Meanwhile, when representatives from Powell were invited to the Lodge & Barker shop to see one of the three lathes for Lunkenheimer, they were so impressed that they immediately ordered two for their company. One couldn't ask for a more promising beginning for a startup business!

In just a matter of months, the biggest challenge facing Billy Lodge and Will Barker was managing the growth of the company, particularly in hiring and directing employees. Lodge had some very specific beliefs in this regard, as he commented to Barker one day, "Remember this, Will: The most valuable acquisition to a business an employer can obtain is an exceptional young man. There is no bargain so fruitful. By the exceptional young man, I mean one who is always looking out for his employer's interest, the young man who keeps his eyes open, who is always trying to make suggestions for improvements in the business, who is always studying for something better, simpler, and more efficient."

"Billy, at this point we only have a handful of people. I don't know why this is relative?"

"It is relative because soon we may be hiring dozens of new men. And rather than just accepting every new applicant on the basis of his mechanical skills and experience, it is possible with the right questions to determine if the individual is a follower or leader. For

every eight to ten new men we hire, we must have one that is a potential leader. Otherwise, we are not looking out for the future of the business."

"It wouldn't bother me if you did all the hiring, Billy."

"I think it is important that we both do it - not together - but one of us following the other during the interview stage. In that way we are less likely to hire the wrong man, who may later have to be fired for incompetence or absenteeism. We are entering the first critical phase of our business when you and I cannot do all the work, or even oversee all the work. So our success will depend on the quality of our employees."

"I agree with you on that, and we need some good men soon or I will be worn out long before I get old."

"A few more good orders and we could be ready to add at least ten men."

By the end of 1880, Lodge & Barker was already employing 60 men, and planning to add 15 more by March of the new year. Even the two partners could not get over how fast the business had grown. Were it not for moving raw material storage to outside, they would have been unable to continue operating in the same building. Their inventory in December came to almost \$7,000 compared to just \$1,000 some ten months earlier. The Fourth National Bank was glad to provide the funds for this rapid expansion, after careful review of their financial data. But the partners knew that most critical to their continued success was their ability to produce a quality product in the face of this rapid growth.

On January 1, 1881 the two partners were reflecting on their surprising success in that first business year. It was late in the evening, after all of the employees had left for the day. Lodge opened a cabinet, pulled out a small bottle of port, and two glasses, and placed them on the table between the two.

"Will, lets drink to a very satisfactory year and our continued future success for many years to come."

"Billy, I don't know if my body can survive very many years like the last one. I'm older than you are, you know."

"Age is in the imagination, Will. If you make believe that you are fifteen years younger than you actually are, and you really believe it, your body soon begins to believe it too. But lets talk about how we can lessen the work load on both of us."

"I'm ready for that discussion."

"The issue is basically one of how best to manage people. We will soon have 75 men. Even together, the two of us cannot effectively manage that many and also overlook sales, engineering, and financial administration. We first need to have excellent shop supervision, so that, any time, either or both of us could be out of here for two weeks and not have to worry about things in the shop. Do we have anyone

with us now that has the potential to run the factory as we would like?"

"I would say that either Bill Herman or Bill Gang are the best possibilities. William Burtner is doing a very good job as bookkeeper, but he may not know the difference between a drill and a tap at this point. Henry Dreses is a very good and thorough draftsman but his leadership capabilities are untested."

"I agree with you on Herman and Gang. Suppose you and I talk separately to each and then make a decision on which of the two may make the best superintendent. After that man is in place for a while, I will begin spending more time on sales and engineering, and you can spend your time on manufacturing, purchasing, and finances. Does that sound like a good approach?"

"I would agree to that - particularly if it reduces my work load. We may have to start a couple more foreman positions as well."

"Alright, Will. Let's try and get all these changes in place by the end of January. I have also been looking around to see what might be available in a larger shop for us, but I am hoping we can delay that for a few years. In the meantime, you might be thinking about which local shops we could place some of our work to reduce our load here."

"There's a new man in town... name of LeBlond... came by the other day to see us. Says he apprenticed at Brown & Sharpe up east. Is interested in building top slides for us. I need to go by his shop and have a look before we place any business."

"Do that. There's a few others I have heard about also. By the way, how do you think Charley is doing?"

"For what we are paying him, great. He has so much experience building lathes, and he seems happy imparting that knowledge to the younger men. I hope he can last for a few more years."

"That's wonderful! It takes a variety of skills and talents to make a good organization. We will soon find out if we have the leadership skills that we talked about many months ago. I cannot emphasize enough that the work of the Superintendent of Manufacture is the most important of all the work in the factory and requires constant and careful attention because of his control of every productive man in the house, and he should know that each individual man is producing work of the very best quality in the minimum time to get the job done."

The following three years saw continued progress in the business of Lodge & Barker, so that in 1884 the company moved into a larger factory on 6th Street and Eggleston Ave. The earlier elevation of William Herman to superintendent was a big contributor in this success, because it allowed Billy Lodge to devote more time to the sales and engineering functions, and lessened the load on Will Barker. For the first time, the company began selling planers and drills that were manufactured completely by other companies.

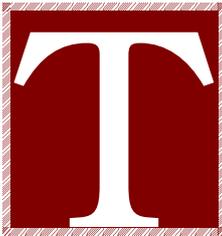
In spite of the success of the business, Lodge and his wife Mary, and their two children continued to share a house with John DeRose and his wife Anna. In 1884, they finally all moved together from Pavillion Street to a larger house at 115 E. 5th Street. The DeRoses had no children, so Anna DeRose made a convenient nanny when Mary Lodge wanted to accompany Billy on one of his sporadic business trips. They had also talked about an extended trip to England and Europe, which Billy kept postponing because of the increasing demands of the business at home.

# 5

## Adjusting to a New Partner

Friday, January 1, 1886

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The new offices of Lodge & Barker were not nearly as spartan as the first. Lodge had a rather massive desk in his office which almost dwarfed Barker as he sat before it waiting for their discussion to begin. There was also a drafting table over to the side, that was frequently covered with various sketches of lathe components. In their tradition, Lodge reached into the drawer and pulled out a bottle of port and two glasses. As usual, it was again late in the evening on this first day of the year, and the shop was quiet.

"Will, let's drink to yet another successful year and, as well, many more in the future."

They both toasted and after a long pause Barker looked up slowly and said, "Billy, we need to have a serious talk about the future."

"Yes?"

"I'm tired. I just can't keep going at this level. After we put more management in place it changed what I do, but it really did not reduce my work requirements. As the business grows, I seem to face more work problems than before, not less."

"That sort of goes along with success, Will."

"That might be, but my body can't stand it any more."

Billy looked at him curiously. "So, what is the solution?"

"I need to get out before it kills me."

"I wish I could acquire your interest, but I don't have the resources that would satisfy you."

"I understand. And I know that you would always be fair to me. So, I guess the only alternative is for me to find some outside interest. The bank tells me that they occasionally have inquiries from

individuals who want to buy a partnership in a going prosperous company. That may be the best place for me to start. It may take a while but I would hope to have it settled before the end of this year."

"I'm not going to try and talk you out of this. All that I ask is that you let me interview your best prospect before you make a final decision."

"I will promise that. You and I have had a great relationship for a number of years. I value that. Be assured that I would never do anything to hurt you or this company. My children refer to you as "Uncle Billy". Why couldn't we have an uncle like him they always say."

"Thanks, Will."

"I also assure you that while this search is going on, the company will have my full attention."

"I appreciate that, Will, because we surely need you."

As the months went by in 1886 there was no further indication from Barker of his plans, until mid-year. One morning in a meeting with Lodge, he reported, "I think I have found a good prospect for my interest. His name is Charles Davis. He's a professional salesman, knows nothing about machine tools, which doesn't seem to bother him, since he does have a degree in civil engineering. According to the bank, his financial resources are quite adequate. He would like to see the shop and talk to you. When would be the best time?"

"Have him come by over the next three days, near the end of the shop work shift. I'll speak to him first, then we can tour the shop when it is quiet without arousing suspicions or gossip."

"I'll see if I can arrange it and let you know. I think you will like this individual."

"I certainly hope so, because I would like a long term association."

Lodge was rather taken back by his first meeting with Charles Davis two days later. With a background in the wholesale drug industry, he was expecting a quiet and demur individual. What he got was an outgoing person, full of personality, with endless questions, like, "What is the purpose of a lathe tailstock?" And, "Why couldn't machine tools be sold by company stores in major cities throughout the U.S.?" If this was to be his new partner, he could see a lot of training and learning time in the months ahead.

Davis quickly commented after being introduced: "Mr. Lodge, you already have quite a reputation among the business community here in town."

"Thank you, Mr. Davis. That is not something I strive for, but it is welcomed. And please call me Billy."

"And I usually go by the name of Charles."

"So, I understand your background is in the wholesale business. How did you come to arrive at an interest in a machine tool company?"

"I have been looking to buy into an ongoing business for the past year. So far, I have looked at a lumber company, a boiler company, and a small newspaper. From what I have learned, I believe that machine tools could be on the threshold of greatness, since nothing in metal can be made without them. You and Will have proved that in just six short years. I also believe that the name 'Lodge' could be made to be world famous, as an American manufacturer of four or five basic machine tools."

"You may be aware that machine tools can be a very cyclical business. We have been fortunate the past six years since the nation is in a period of economic prosperity. The 1870's were not very kind to many machinery companies."

"Any hard-goods business is going to experience cycles. We can learn how to live with that."

"Well, Charles, let me take you through the shop so that you have a better understanding of what we do here."

"I'm ready, Billy."

"Will, do you want to accompany us?"

"If you don't mind, I would like to leave now. I've had a very busy day. Anyway, Mr. Davis and I will probably be meeting again in a few days."

Charles Davis had seen manufacturing shops before so he wasn't totally surprised with all the belts and pulleys driving the machines. But machine tool terminology was a new language for him.

"Can I ask what a monitor lathe is?"

"That's what we and many others call a turret lathe. The name 'monitor' came from the iron clad warship of civil war times with the revolving gun turret. I'll show you one in a moment - a turret lathe that is."

And so it went on for the next hour and a half, question, after question, after question. Lodge was impressed with the inquisitiveness of Davis, but he was becoming weary of answering so many simple questions. Furthermore, his stomach was telling him that it was past supper time, so he soon found reason to dispatch Davis for the evening.

Barker seemed rather defensive on the Davis question when Lodge tried to discuss the issue with him the next day. Perhaps it would be better to let it rest for a while, Lodge thought. Thus it was another two weeks before Barker came into his office later in the day to report that he and Davis were working on the basics of a purchase contract.

"I'll promise to do this much for you, Billy. I will spend as much time as it takes to get Charles educated in Machine tools after this

deal is finalized. You won't have to worry about him. I can't make an engineer out of him, but he should at least know enough to be able to sell our products."

"That would be a big help, Will. He does seem to be energetic and smart, so once he is educated he should be able to make some contribution to the company."

However, Lodge knew that it would be a long time, if ever, before Davis would have the knowledge to oversee manufacturing as Barker had done. Thus, there would have to be a realignment of the duties of the new partners over time, with Davis ultimately assuming responsibility for the sales and financial functions. Lodge seemed comfortable with this prospect, assuming that his assessment of the capabilities of Davis was correct. He didn't mind relinquishing his role in sales because he welcomed the opportunity to spend more time in engineering to develop some of the new concepts in lathe design that he had in mind.

The official arrival of Charles Davis several weeks later was a little more touchy than Lodge had expected. The superintendent and ten foremen were brought into Lodge's office where he was introduced. Will Barker then explained who Davis was, as well as the reason for the transition, and why it was in the best interest for everyone. They then did the same with the sales assistant, the bookkeeper, draftsman, and office clerk. None of the employees in these two meetings asked a single question, which troubled Lodge.

Later that day, Lodge made a complete tour of the shop to try and determine what kind of feedback he would get from the employees. The first foreman he approached commented: "Uncle Billy. I hope you're not thinking of leaving us also."

"Richard, at 37 I'm far too young to think of retiring or to be your uncle." That last comment made in reference to his initial salutation. "I have very big expectations for this young company and believe that Mr. Davis will help us attain that potential. I hate to see Will Barker leave us, but he has good personal reasons for doing so."

After talking with several other employees Lodge realized that the main concern was that they thought that Charles Davis might also buy out Lodge's interest, and they would then be losing the two leaders who hired them in the beginning. It took a number of days and many conversations to convince everyone that this was not the plan. Lodge wanted to make sure that all employees were sold on the company's future, since most of them could leave at any time and quickly find at least a comparable job in the very strong 1886 economy.

As the year progressed, Lodge and others began to have doubts about the contribution of Charles Davis. He had yet to bring in an order

that was not in process before his employment started. Finally, on a trip to Chicago in late fall, he returned with an order for three lathes from a printing press manufacturer that no one had heard of before. Word quickly spread through the company on his accomplishment, and from that moment on there were few questions asked about his ability.

Thus it was beginning to look like the new partnership - now Lodge & Davis - was off to a promising start. Most importantly, the two of them quickly developed a friendly relationship, one of mutual respect.

# 6

## Consumed by New Orders

Friday, December 31, 1886



Shortly before the year ended, Lodge told Davis that he and Will Barker had a tradition of toasting the Old and New Year on every January first after the employees had left for the day. Davis would never be one to break a tradition, so he readily agreed. But since January first fell on Saturday this year he suggested they move it up a day to Friday. They had also had a discussion about making that date the fourth paid holiday of the year, as many other employers were just now doing, but decided to postpone it until 1887, and make the holiday Monday.

Thus, the two of them sat at Lodge's large desk, although somewhat uncomfortable at first. Lodge pulled the customary bottle of port and two glasses from a desk drawer, poured one for each of them, and offered the following: "Here's to many successful and happy years together, Charles."

"I'll drink to that."

"What is the first thought that comes to mind after spending less than half a year in the business?"

"Well, I am more convinced than ever that I made the right decision in joining up with you, since I see such great potential for this company."

"What could we be doing to hasten that potential?"

"You could invent a lathe with more capabilities than any in the world so that we could corner the market like the Rockefellers."

"I still dream of that possibility. More than likely our engineering improvements will be incremental. What is more probable is some major improvement in our manufacturing that would give us a

substantial cost advantage over competitors. I'm not ready to propose anything in that direction at the moment, but I do have some ideas."

"From my perspective as a salesman, I would like to have more compatible machine tools to offer with the Lodge & Davis name on them. Then on most every call I make, if a customer has no need for a lathe today, I ask him, 'what do you need?' If he says, 'a shaper or a planer,' for example, I say, 'we also have those in our product line.' I realize that may complicate your life in manufacturing, but that is the salesman's ideal situation."

"Hopefully, Charles, we can come to a balance that we can both live with. In my opinion, the lathe is still the most needed machine tool, so it should be our lead product, and most profitable."

"I don't disagree with that judgement, Billy."

The young Lodge & Davis Company continued to experience success over the next few years, as their line of lathes achieved more prominence, and they expanded further into planers, shapers, and drills. Lodge was careful to make sure that these related machine tools did not take capacity from lathe manufacturing, so most of the manufacturing for non-lathe products was done by outside contractors, many of whom were started with Lodge & Davis assistance in one form or another.

It was now time to begin prospecting in Europe. The company had received several inquiries from Europe, but the expectations were low without someone actually calling on customers. The partners had a discussion on this subject in early 1889.

"Charles, I've had an invitation to visit with Alfred Herbert, one of the upstarts of the British machine tool companies. I would also like to visit with my family in Leeds, which would be my first visit back. My brothers write me that my parents are not doing too well and that I should not postpone a visit much longer."

"That really could be timely. You might also want to take a couple extra weeks to see if you could set up some agents in London, Paris, and Berlin. Now that I am more comfortable in the factory, I could get by without you for six weeks or so."

"I could probably do that. Would you have any names of prospective agents in those cities?"

"I'll see what I have. Machine tools are still a young product, so about all that you might find for prospective agents are industrial supply companies. Would you take Mary with you?"

"I think so. She wouldn't miss this trip."

The Lodges were both apprehensive and excited as their train neared the station in Leeds, England. It had been over twenty years since Billy left these surroundings. He hoped that not much had changed, and judging from the scenery on the train ride, it appeared to be the

same picturesque grey stucco buildings that he remembered in his youth.

Billy was not surprised that both of his brothers were there to meet them when they arrived. They were pretty close when they were young, so a spontaneous emotional embrace with the three seemed a natural thing to do. Mary stood to the side and let them carry on for a moment. Finally, Billy said, "Mary, I'm sorry... These are my brothers Samuel and David."

"I'm pleased to meet you both," she said. Mary felt as if she had met them before. She also noted some familiar Lodge characteristics in her daughter Augusta. They gave her the customary hug, then Samuel, the older of the two said, "For your three day visit we thought it best to put you at the Inn. Mother can't stand much activity in her home, and father has withdrawn into a shell. And no one else has an unused bedroom."

"How is she doing otherwise?"

"She has been rather depressed until she heard about your pending visit. It's unfortunate that you couldn't visit a few years back when they were both in better spirits."

"I know, I know. I just had too many things going on, mostly with this new partner coming into the company, as I wrote you."

Billy and Mary Lodge had a wonderful three day visit with the Lodge relatives. They all found Mary to be very charming, and she quickly established a close bond with a number of them. While it was sad leaving Leeds, they both knew that the three day stay was quite adequate under the circumstances. They would now head down to Coventry and then on to London, where Billy had high expectations for establishing good business connections that would open doors to the markets in England and on the Continent. He knew that some of the most significant developments in the world of machine tools prior to 1850 took place in England, so one would assume that the British were ahead of the rest of Europe in developing the market.

Coventry is a quaint city about 60 miles north of London, and the home of Alfred Herbert Machine Tools Ltd. Alfred Herbert was considered a pioneer in the British machine tool industry, and although he had never met William Lodge before, they both had heard stories about each other's activities in their respective countries.

Lodge intentionally arrived at the company offices early in the morning to give him a sense of their work habits. A nice looking English gentleman asked if he could be of help, to which Lodge replied, "Yes, I have an appointment with Mr. Herbert."

"You must be Mr. Lodge. And I am Alfred Herbert. I am pleased to meet you and have you visit us. It is good that you came early because it will give us more time to look over the shop."

"It is my pleasure for you to have me, Mr. Herbert."

"Should we sit a spell and go over our agenda? I presume your first issue is the inquiry for the drill press machines that we recently posted?"

"Yes, I have some lithographs and prices for you. As I wrote earlier, I am also interested in establishing contact with agents in London, Paris, and Berlin, if you could be of some assistance there."

"I think we can be of some help. But let us go visit in the shop first."

Lodge could hardly wait to get a look at the shop, since he expected something more advanced than his own. That was not to be the case. The first machine tool that he saw was a recently installed planer that was barely making a cut. Lodge observed for a while, until Herbert said, "Does that interest you Mr. Lodge?"

"Very much. We could sell you a planer to replace that for 100 pounds."

"That one only cost 65 pounds."

"That's all it is worth! Our machine would reduce your job time by at least 30%."

"We're always interested in more efficient machines. Let's talk about it when we get back to the office."

Lodge and Herbert spent the next three hours in his office going over the features of the Lodge & Davis planer, the drill presses, and potential agents in London, Paris, and Frankfurt. When Lodge departed, he had an order for three drill presses with a check for the same, a tentative order for a planer, and letters of introduction to three agents in the respective countries. It was a great beginning for a long association, and what would prove to be a very substantial future market for Lodge products. He gratefully declined a luncheon invitation from Herbert because he felt that he already accomplished far more than expected, so why chance what was now securely in the satchel? And he still had to visit in London, and then travel to France and Germany.

Upon his return to Cincinnati, Lodge was pleasantly surprised to find that the shop ran quite well in his extended absence. Charles Davis liked to believe that his own personal oversight was the main reason, but Lodge knew that it was the fine work of the shop superintendent, Nicholas Chard, that made this possible. That is why Lodge was so surprised by the proposal Davis made to him in a conversation after his return. "Billy, the person that I did not realize was so valuable in your absence was our bookkeeper, William Burtner. He coordinates a lot of activities in the office area. I don't know how we could get along without him, but I'm concerned that he may be looking for opportunities elsewhere."

"Charles, any employee who isn't always on the lookout for a better opportunity doesn't have much potential."

"I agree. But, why loose a man, and then have to spend months training his replacement, if we don't have to?"

"So, does he deserve a big pay increase?"

"That would give us a problem with a few others. I was thinking of company stock."

"From where?"

"One percent from each of us would be sufficient to tie him to us."

"That's rather bold. I would have to think about that for a day or so."

"Billy, I really feel strongly about this person. I also believe he could learn how to sell and thus be sort of a back-up to me."

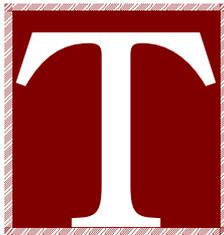
Lodge pondered this question for a good week. He was not comfortable with it. If he was going to give shares to anyone he would prefer that it be Chard, who he thought was much more valuable to the company. Burtner was more easily replaceable. But above all, the potential future impact of the decision was the most bothersome.

Meanwhile, there was no letup in the surge of new orders. They were really straining to keep up with it. And every day Davis would bother him with the Burtner question. Finally, in frustration, he yielded to Davis and said that he would consent to give a 1% interest to William Burtner, if Davis would do the same.



## End of Honeymoon with Charles Davis

Thursday, December 31, 1891



he setting was the same as in previous years. Billy Lodge and Charles Davis were seated at Lodge's large desk with the bottle of port between them. They each filled their glass, Lodge raised his and said, "To many more prosperous years, Charles."

"Could get even better, Billy. I have some thoughts in that regard."

"Yes?"

"From what I saw this past year, we seem to be devoting more manufacturing capacity to lathes at the expense of planers, shapers, and drills."

"We have always tended to do that since the other products are made outside for the most part."

"But now that some of the outside contractors are at capacity I expected that we could fill in."

"We have the same capacity problems."

"Only because you are giving first priority to lathe manufacture."

After a long pause Lodge said, "Bear with me for a moment while I recite some history and background."

"Go ahead."

"The U.S. Government awarded its first contract for guns with interchangeable parts to Simeon North in 1813. In 1854, when I was just a child in England, the English Royal Small Arms Commission made an extensive tour of American armories. They were so impressed with the visit that they ordered 150 replicas of the machine tools on the spot. They later referred to what they saw as the *American System* which, aside from the idea of offering

interchangeable parts, saw production broken down into the character of the work, and the machines designed for each operation."

Lodge studied his reaction, then continued, "When I was with Fairbairn, arrangements were made in 1868 for several of us mechanics to visit the Enfield Armory, and we too were amazed at the American system in operation there. That experience, more than anything else, convinced me that I should move to America due to the extraordinary opportunities in manufacturing. Now, aside from guns, the American system has been applied to sewing machines and typewriters, but not yet to machine tools. We could do that with lathes."

"Billy, you are such a dreamer, and an optimist. We all know that the Government buys guns in lots of tens of thousands. Lathes may some day be made in tens."

"If we concentrate on lathes only and produce them in mass loads, I foresee the possibility of lot sizes near a hundred."

"But why should we take that risk? We can already sell more shapers, drills and planers - in addition to lathes - than we can supply. And all due to our reputation and sales success."

"That won't last forever, Charles."

"Into the foreseeable future. And that's a lifetime for me."

"Can we talk some more about this next week?"

"Sure!"

What Davis did not realize is that Lodge had been gradually reorganizing the shop and reengineering lathe products across sizes to prove out some of the principles of interchangeable parts and discrete part manufacture. He knew that the potential gains in efficiency were enormous, particularly if manufacturing lots could approach 100 lathes in the popular sizes. Was this 100 number a dream, as Davis suggested? And was he really just an optimist? One thing was certain - it would be impossible to attain this lathe production level if the company also had to manufacture planers, shapers, and drills. Leave that business to other companies, along with the additional capital investment necessary. The immediate question was how far to push this issue with Davis. It was no surprise that Davis considered him to be such an optimist. He had heard that from others as well, including his wife, Mary. But, he still felt that he was realistic in his assessment of the risks.

Lodge tended to avoid Davis on the next workday, but it only lasted a few hours when Davis cornered him in his office.

"Have you thought any more about this question that we discussed after our toast the other evening?"

"Yes, and I haven't changed my mind."

"This is an important issue, Billy. It concerns the future of the company. I suggest we convene a special shareholders meeting tomorrow evening with you and I, and Burtner."

This was beginning to sound a little ominous to Lodge, but he could tell that there was no merit in postponing the issue either.

"Alright, but you have to give me time to explain the matter to Bill Burtner, since this is a new issue to him, as far as I know."

"That's fair enough."

Everything seemed rather cordial when the shareholders meeting began. Burtner acted as the secretary, and Lodge gave a long presentation on the values of interchangeable parts, and discrete part manufacturing, including efficiency studies done in the shop. Much of this was new material to both of them, so they asked a lot of questions. But Lodge knew that the weakest part of his presentation was the projection of potential lathe sales approaching 100 units a month, far beyond current shipment levels, and without any reliable back-up data.

After about an hour of discussion, Davis called for a voice vote. It did not surprise Lodge that Burtner voted his 2% with Davis' 49% and against Lodge's proposal.

"So, what does this mean?" Lodge inquired.

To which Davis replied, "It means that we will now make a much more active effort to provide a full range of machine tool types to our customers, even at the expense of lathe manufacture."

"If that is the case, you don't need me, gentlemen."

"So be it. How would you like the record to read."

"That's up to you. As I see it, after twelve years of steady growth, I was voted out of my own company. What more is there to say? Good day, gentlemen!"

Ambushed! That's the only word that would come to mind as Lodge made his way home after the meeting. Why did he ever let Davis talk him into giving Burtner 1% of his shares. He had such faith in people that he tended to trust Davis. But now it appears that he had been manipulated by Davis, whose ego was so overcoming that he couldn't bear to stand just an equal role in managing the company. Lodge should have remembered his experience at Chambers in Philadelphia more than twenty years ago. Most people you can trust implicitly; others need to be watched.

Lodge was not one to seek out retribution. But he was sure that whatever he did, it could be rather difficult for Davis after Lodge's sudden departure. He thought about how he had personally hired and promoted all of the shop foremen and superintendents, and always treated everyone with dignity and respect. In frustration, he also recalled that many of the design patents were in his own name and not the company's - there never had been a formal document

assigning rights to the company. Lodge could probably hire any of these individuals of his choosing. He could also make it impossible for Lodge and Davis to manufacture products covered by any of his patents, particularly the pulley head lathe patent. When Davis realizes his vulnerability, he would likely approach Lodge with some offerings. If not, it might be necessary for Lodge to bring these matters to his attention, but certainly with the recognition that he had no intention to do serious harm to a company in which he still held a 49% interest.

Tomorrow, Lodge would come in and clean out his desk and drawing board. But the most difficult task would be to say goodbye to many of his old supervisors and employees.

The meeting with H. P. Cooke, Vice President at Fourth National Bank was only several days after Lodge's departure from his company. Lodge was most anxious to get started with a new business, and he knew that the key would be how much money he could borrow on his personal recognition, or on his stock in Lodge and Davis, in the absence of an immediate buyer for it.

"Now, Mr. Lodge, do I understand that you were voted out of your own company, and that you don't have a buyer at this time for your 49% interest? You now want to borrow some funds to start another company that you propose calling The Ohio Machine Tool Company?"

"That is it in a nut shell, Mr. Cooke. I spent twelve years building a company from nothing to one with more than 600 men, and now I am forced to start all over again."

"We could be of some help. Perhaps with your Lodge and Davis stock as collateral we could provide a \$20,000 loan."

"Only \$20,000? The Lodge and Davis stock is worth many times that."

"It may have been before, but not now. Its only 49% of the company. And the company's most important partner – namely, you – have left the business. If you get started anew and are making good progress, we might be able to come up with more funds."

"That is really tight, Mr. Cooke. I was counting on twice that much."

"Give it a try, Mr. Lodge. We know that you started up and made a success of one company. We have confidence that you can do it again."

Lodge pondered his remarks, looked again at his estimated budget to see where he could cut. Reluctantly, he consented, but said, "I know I will be back again."

"If your figures look good, we can help."

Lodge had heard about the availability of a shop building at Court Street and Harrison Avenue, so he thought he should see it. Its

previous tenant was a boiler manufacturer, so he assumed it was more than adequate for building lathes. The building needed some minor repairs, which the owner agreed to, so he promptly signed the lease, and made more specific plans for beginning operations.

It was fortunate that Lodge had begun making duplicate sets of many lathe drawings for the past few years because of numerous patent applications. The extra sets he kept at home, so when it came time to order patterns and jigs for the new company he didn't have to start from a blank sheet of paper. Thus, it looked like he could get the new company up and running even sooner than he expected. However, it now looked like he would need to borrow more before he showed any income, which would not be pleasing to the bank at all. He best discuss this with them before things got too bad.

It was almost like Mr. Cooke at Fourth National Bank was expecting his visit. He probably noted that Lodge had drawn down most of the \$20,000 loan, and in only a few short months.

"Mr. Lodge. What can we do for you today?"

"As I expected, I am going to need more than the original loan that you provided. Because of the strong economy, I underestimated the cost of jigs, fixtures, and patterns to start lathe production."

"Are you generating any income yet?"

"We do have some orders, but it will be a few more months before shipment."

"Mr. Lodge, would you entertain the thought of a new partner? Someone with money?"

Lodge pondered the question for a while.

"Who is it?"

"Do you know the Shipley family?"

"From the Sechler Company, the horse carriage builders? Very prominent company I hear."

"Correct. They are looking for a situation for a junior member, who does happen to be an engineer."

"I would at least talk to them. Of course, I would want an extensive interview with the prospective partner, after my most recent experience."

"I may see one of them today, so I will indicate your desire to meet and talk. Do you have an attorney that you could use if necessary?"

"Not in some years."

"Let me suggest one that is very good at this type of work. His name is Edwards Ritchie, and his office is at 44 Wiggins Block."

"Let me emphasize, Mr. Lodge, that you really need a capital addition to your company. And without an immediate sale of your interest in Lodge and Davis, it seems that you have no alternative but to take in a partner who has money and, importantly, banking connections."

"I respect your judgement, Mr. Cooke. I agree to meet with the Shipleys at the earliest."

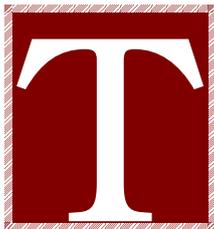
After leaving Cooke's office, Lodge thought to himself, "Unless someone came forward with a huge offer, I have no intention of selling my interest in Lodge and Davis at this time. It's always possible that Davis and Burtner could run into serious trouble, and the banks may insist that I return to resurrect the company. Wouldn't that be satisfying?"

The following week Lodge met with the Shipleys three times. The first meeting was purely introductory; on the next occasion, he spent time in their shop with Murray Shipley, Jr., mainly trying to assess his personality and capabilities. The third meeting was spent in framing the main points of an agreement that Lodge would deliver to lawyer Ritchie for his input and preparation. While Lodge did have some apprehension about taking on yet another partner, he knew that he had no choice if he expected to move quickly on a new company.

## 8

## Enter Murray Shipley, Jr. in 1892

Saturday, August 6, 1892



He law offices of Edwards Ritchie were rather impressive for just a young attorney in practice by himself. Aside from the usual array of legal books on a shelf behind his mahogany desk, there was ample space for the four visitors to be comfortable in his office in the large cushioned chairs. The visitors were, specifically, Murray Shipley, C.W. Shipley, Murray Shipley, Jr. and William Lodge. The purpose of the meeting was the signing of the contract leading to the formation of the Lodge & Shipley Machine Tool Company.

Mr. Ritchie began the meeting, "Everyone has seen and apparently approved the contract to be signed today, with the exception of Mr. Shipley, Jr., but let me quickly review the basics. The capital stock will be \$100,000 with 1000 shares to be issued, which values each share with a par value of \$100. Mr. Lodge is to be President of the new company at a weekly salary of \$75. Mr. Shipley, Jr. will be Vice President, with a salary of \$60 per week, until a year from certification, when his salary and Mr. Lodge's will be the same."

The four nodded in unison, and Ritchie continued: "The Shipley family will put up \$30,000 in capital, in cash and notes, and Lodge will put up all the assets of the Ohio Machine Tool Company, valued at least \$20,000, except for Lodge's patent on the Headstock Pulley device. There is also a clause that would allow Mr. Lodge to reassume a role in the Lodge & Davis Machine Tool Company under certain circumstances. I presume everyone is aware that Mr. Lodge has still not sold his interest in that company because he has not found anyone to pay him what he feels it is worth, including Mr. Davis himself. Mr. Lodge has requested, and everyone is in apparent agreement, that Mr. Nicholas Chard, be granted some specified

number of non-voting shares. This is part of the offer to lure him away from Lodge & Davis, where he has been their superintendent for the past six years."

Ritchie looked up occasionally to study their reactions and continued, "Now, Mr. Shipley, Jr. is not satisfied with the language of the clause under patents covering Lodge and himself, which only gives the company exclusive rights in the U.S. I will do over that language, which both have approved, and they can sign it when we next meet on August 25 to review and sign the company bylaws. In the meantime, if Mr. Lodge and Mr. Shipley, Sr. will sign this document today, it will be binding on the parties, and things can move forward."

At that point C.W. Shipley thought it appropriate to comment, "My role in all of this is to be an advisor to the Senior and Junior Shipleys, but I will say that I have been quite impressed with the professionalism of Mr. Lodge and Mr. Ritchie. I truly believe that this will be a long and successful partnership, and that the company will leave its mark on the world machine tool industry."

To which Lodge replied, "Thanks for your confidence C.W. I too feel very good about this association and the company's prospects."

Thus was the real beginning of the Lodge & Shipley Machine Tool Company. As a result of his engineering training and natural talent, Murray Shipley, Jr. was able to make a significant contribution to the company, perhaps more so than Billy Lodge anticipated.

Because he was unable to sell his interest in Lodge & Davis, Lodge was strapped for capital. He also lacked banking connections, as he quickly found out when he tried to get the Ohio Machine Tool Company up and running. The Shipleys brought that urgent need of capital to the new company, and Lodge tended to think that would be their primary contribution.

In dividing up the partners' responsibilities, it was decided that Murray Shipley, Jr. would assume management of the engineering and drafting functions, and gradually take on the financial side also. That would leave manufacturing and sales to Lodge, which was slightly different than the division with his two previous partners, but quite acceptable to him. The only problem was that he had been unable so far in convincing Nicholas Chard to join the company, which meant he had to spend extra time overseeing manufacturing.

In 1892, most observers would have said that there could not have been a worse year to start a new company, due to the stock market crash and panic that occurred in the following year. But that was not quite the case. Lodge's personal reputation in machine tool building was so strong, that as soon as he had the new capital to finance inventory and receivables, the company experienced an almost immediate surge in new orders for lathes, that helped carry them

through the two worst years of the recession. Not that there were easy decisions during those years, as Lodge expressed to his superintendent one day, "William, you know how opposed I am to separating employees during periods of temporary business contractions. However, that should not prevent us from weeding out those weak employees during these periods and maybe not filling the vacancy immediately."

"We have been doing some of that, Billy. But we could probably do more. Any sign of an order upturn yet?"

"Many of our agents are reporting an increase in quotations, but we haven't seen it in new orders so far. The business press is saying don't expect an upturn until '96 so it may be another year or so. If necessary, we can keep a lot of our good people busy with heavy maintenance projects, such as machine rebuilding. The final stage would be to go to shorter hours."

"I hope it doesn't come to that."

"So do I. Murray is already complaining about our high payroll costs as revenues decline. Hopefully, business will come back sooner than the forecasters think."

Lodge & Shipley's new orders did begin to recover in 1895, thanks to strong activity from Europe, where the company was surprisingly able to establish a good foothold. The steady simple theme of *Lathes - Good Lathes Only* seemed to be taking hold in many market areas, aided by product features that were ahead of the competition. At the same time, Lodge was gradually introducing interchangeable parts production to the shop, after it was expanded further on Culvert and Harrison Avenues. However, he knew that to really implement the so-called *American System*, a new factory would have to be built from the ground up. This had been in the back of his mind the past year or so.

One morning in 1896 he walked into Murray Shipley's office and said hurriedly, "Murray, I've got news..."

"Yes, Billy?"

"I sold my interest in Lodge and Davis."

"To whom?"

"Thomas P. Egan."

"The woodworking machinery people. Now that is interesting!"

"Yes, it is. Apparently Egan made an arrangement with William Burtner to buy his 2% before he would buy my 49%. That may give Charles Davis some headache, since Egan could have 51% control. Egan knows the machinery business, but he doesn't know machine tools, so I don't view them as a very big competitor to us in the future. In any case, he promised they would no longer use the Lodge name in the business, which is good, because it has been a little confusing for our customers. They are even thinking of changing the name to The American Machine Tool Company in order to take full advantage of the American reputation in Europe."

"That is a turn of events! Now we are free from that clause in our original contract that gave you rights to rejoin Lodge and Davis under certain circumstances."

"How true, Murray. But more important, what it means is that we can immediately give serious planning to a totally new manufacturing plant."

"How so?"

"Because I now have substantial liquid assets, that should have an influence on the bank when we eventually go to them for a large loan for this plant. Also, the bank could demand some loan covenants, such as restrictions on dividends, which I can now tolerate more so than before."

"That would be unfortunate if dividends were restricted. We just paid our first dividend this year in '96 - a meager \$1.20 a share on only 1000 shares, but you and I talked about substantially increasing that in the next few years."

"I know, I know. Could you and your family get by if we had to suspend dividends for three or four years, which I see as a worst case scenario?"

"I'd have to convince my father and uncle."

"Murray, the economics and efficiencies of this new plant would be so great that I can't imagine that they would discourage us from going ahead."

"Do you think it is time for the two of us to begin some preliminary planning on a new factory, and what it could do for the company?"

"Lets do it. With our finances looking better by the month, it's possible the bank may be very lenient with covenants, such as limiting dividends to 50% of net income. That wouldn't bother us at all."

"Have you done anything on the new factory, so far?"

"I've got a few sketches that I can give you as a start."

"I'm not surprised. Sometimes I think you work in your sleep."

"No. I just don't sleep very much. Life is too much fun to waste it with unnecessary sleep. And - oh, yes - one other thing that the sale of my Lodge and Davis interest does - Mary and I can now afford a nice home, after sharing one with my brother-in-law for 23 years. We have been looking at a house at 800 Ridgeway Avenue in Avondale."

"That would be a real change for you."

After several discussions on the new factory shops, the partners readily concluded that construction should start no later than mid-1898. The first phase would be a two story office adjacent to a 90 foot wide by 340 foot long manufacturing shop, of approximately 30,000 square feet. Then, if business continued to increase, shop number 2, of some 20,000 square feet on two floors, could be added in 1900 or 1901. Shop number 1 would have the capability to have at least 50

lathes in final assembly at one time, and would have the latest in heating and material handling systems.

A potential 6 acre site out on Colerain Avenue had been identified. By the time it was necessary to approach the bank on a financing plan to start construction, company shipments and profits showed even further improvement, so they had no problems in arranging a satisfactory loan. Things were really beginning to fall into place.

## 9

## Full Implementation of the American System of Lathe Manufacturing

Saturday, February 4, 1899



Who would have thought that a manufacturing shop could be described as "elegant", even after being decorated for an evening of formal dining and dancing. But, so it was! The occasion was the commemoration of the new Lodge & Shipley Machine Tool Company factory on Colerain Ave, attended by over 200 employees and wives. The interior was decorated with all the national colors, and with pictures of President McKinley and war heroes from the recent Spanish-American War. Dennis Byrne, the general foreman, served as master of ceremonies. A fine string band gave zest to the occasion and the dancing that followed the feast. It was a celebration fit to be remembered, as the company entered another sustained period of growth.

The following year Billy and Mary Lodge faced one of their personal milestones with the marriages of both of their daughters, Augusta and Mary Felicia. The house would be a bit quieter now, until the frequent visit of grandchildren began in the following years. Augusta married Louis J. Dolle, already a successful attorney, and later a Director, and then Chairman, of Lodge & Shipley. Mary Felicia married Louis B. Weber, who was President of the Elmwood Castings Company. With the Lodge & Shipley Machine Tool Company firmly settled into its new facility, the sales and advertising message became very consistent for the next decade:

*We manufacture only lathes and their attachments, and concentrate our entire energy on them. We manufacture them in large quantities, with a complete system of jigs and templets. We do not manufacture drills nor milling machines nor planers, nor any other machine tool than lathes. Each piece of each size of lathe, no matter how small, has been made the subject of careful study and development, and thousands of dollars have been spent in getting ready to manufacture each size before the first one of the size is made. The concentration of our efforts on the manufacture of lathes ONLY permits each of our machinists to become an expert in his special line; certain men turn cone spindles from one year's end to the other; other men turn cone pulleys; other men plane beds; other men scrape and line the lathes, and so on; each man, therefore, becomes the most expert possible, and does not jump from one character of work to another. This enables us to sell a really good lathe at a reasonable price.*

This is the essence of the *American System* applied to the manufacture of a machine tool product, and it was enormously successful. Earnings and dividends continued to increase during the early 1900's period, until peaking at \$60 per share or \$60,000 in 1907. This was more than the original total capital contribution of the partners in 1892. However, in 1908, dividends were suspended due to the depression that year, but then resumed the following year at \$25 per share.

Yet, in the face of this success, Billy Lodge knew that competitive lathe manufacturers were underpricing their own products, since he was certain that no other company could match his efficiency. He and Murray Shipley were discussing this subject one morning in 1901, "Murray, I just got the results of an award at one of the Government Arsenals. We were underbid by one of our Eastern competitors on three 20" lathes by more than 15%."

"No!"

"That's what I said. This has been going on for a while. These men don't know how to price their machines to reflect their cost of capital and investment. And this is in a strong economy."

"What can we do about it?"

"I'm thinking about trying to organize a meeting of all of the lathe builders - there may be 17 of them - and probably meet in New York City, since there are so many companies in the East and in New England. Perhaps have a presentation by a reputable cost accountant, who could devise some kind of representative cost and income statement to illustrate how all costs in running a machinery business should be recognized."

"You will have to be careful of the new antitrust laws."

"So I have heard. We would not be discussing prices - only costs. I would also like to bring up the subject of standardization, such as

lathe spindle noses, so that chucks and face plates from one lathe would be interchangeable with another made by a different company."

"Isn't that self-defeating, Billy?"

"If we dominated the market it might be. But we are not that dominant. There are thousands of customers, who don't have our lathes, where standardization could be a big advantage. In many cases we can't even get in the door because the customer has such a big investment in other chucks and face plates that won't fit our lathes. But once we get our first lathe in there and they see how good it is, they will never change. It's breaking down the resistance to that first order, and spindle nose standardization could be a big help."

"I wish you success in arranging the meeting. Let me know if there is something I can do, or if you want me to attend to help out."

"Will do. And I will keep you advised of my progress."

After numerous letters, and even phone calls, Lodge was able to arrange a meeting in New York in the winter of 1902. The subject of costs was presented, but there was not enough time to talk about standardization. But the surprise was, that since a number of companies present made more than just lathes, it was decided to include all types of machine tool companies in future meetings, and to move forward on forming an association. The formal organization meeting was then set for Niagra Falls, New York in June of that year. This was the beginning of the National Machine Tools Builders Association, and William Lodge was named 1st Vice President, and two years later, President, when the Annual Meeting was held at the luxurious Grand Hotel in Cincinnati.

Walking through the shop one morning Lodge was approached by Nicholas Chard, his new superintendent.

"Billy, we have another group of apprentices about to start. Would you be available to address them about four this evening?"

"Sure. Anything special you want me to say?"

"Just your usual thing, Boss. Dennis Byrne will also be there. I think this is a pretty good group."

"Great! I'll see you at four. Anyway, how's it going, Nicholas? Are you happy that you finally rejoined us after all these years?"

"Billy, I could never have lived with myself if I had not at least made a try at being my own boss. Partnering with Will Barker may not have been the best decision, but I didn't have enough money to do it totally on my own. Will Barker did not really want to work that hard, and I couldn't see where my interest would grow that much in the future. So here I am."

"And what do you think so far?"

"It's quite a pleasure to work in a brand new factory. I'm also amazed at how far you have progressed with this interchangeable

parts effort. You have likely left the old Lodge and Davis firm way behind."

"We hope so. We have a big investment here and it will take a while to pay for it. See you later. And – oh, yes - it's sure good to have you back with us, Nick."

"Thanks, Sir. Is it okay if I call you Uncle Billy?"

"You wouldn't be the only one, Nicholas. It makes little matter to me if it's not done in jest."

Lodge tried to make a practice of always addressing every new group of apprentices on at least one occasion. It would usually be a brief history of the company, its products, and plans for the future. But he would always conclude with a few fatherly remarks that best illustrated Lodge's personal philosophy, and which he intended to incorporate in the book on *Rules of Management* that he just started writing:

*Remember... if YOU want to be something more than the average worker, you must do something more than average work. If you expect to become an important figure in the world of commerce - a captain of industry, instead of a common soldier in the ranks of labor - you must put your shoulder to the wheel and push, and push hard. It is astonishing how many young men are trying to get a living without hard work. It does not seem possible that so many people could live off one another without really producing anything themselves. Everywhere we see young men looking for easy places, short hours, and the least possible work for the greatest possible salary. Even if it were possible to get a living with a very little effort, you could not afford it. You could not afford to coin your brain into dollars, to make dollar-chasing the ambition of your life. There ought to be something larger in you than that. There is something in you that will not be satisfied with this sort of life, something that will protest against selling yourself so cheaply. You cannot respect yourself unless you are doing your best, making your greatest effort to bring out the best thing in you.*

Chard and Byrne were carefully watching the facial expressions of this group of eight during Lodge's remarks. It was not difficult to identify the skeptics.

The most significant development in metalworking technology in the early 1900's period occurred with the introduction of high speed steel cutting tools, as a result of the work of Frederick Taylor over the previous ten years. The only problem with the lathe of those days was that it could not fully utilize the new cutting tools because the leather belt used to drive the spindle from the overhead pulley would slip whenever the machinist tried a heavy cut with the new tools. This

was true of lathes from all builders. Billy Lodge and Murray Shipley were well aware of this shortcoming, and discussed it constantly.

One day in 1904, Lodge asked his partner, "How are we doing with that new gearbox-headstock, Murray?"

"The latest version looks pretty good. We finally got some good matching gears that don't leave any marks on the work piece."

"Still the 18 spindle speeds?"

"Yes. And over a range of - say, 10 to 400 RPM. I have enough confidence in this latest prototype that we may start drawings for the patent application."

"That would really be great. If this gearbox concept works as we hope, it could be a real competitive advantage for us. I see the possibility of having to offer both the new geared head design and old pulley head for a few years, until the geared head takes over."

"I know how important this is to you, but we are still a few years away from a finished product. Don't you think we should build several prototypes and run them in the shop for a while?"

"Definitely. We can't afford to shortcut this new product - as urgent as it is."

The so-called geared head or patent head lathe was introduced in 1906. It was immensely successful and soon became a market leader. In 1908, Billy Lodge instructed his managers that beginning the next year, he was planning on shipment levels of more than 100 lathes a month on all models, and he expected each of them to make the necessary plans in their respective areas to attain that level. He did not tell them that in just another five years they may have to double that number to 200 lathes per month.

About that time, the company was building eleven different models of lathes - in swing sizes (maximum workpiece diameter over the bed ways) from 14" to 48" - with almost half of production in just the 14" and 16" models. Then, instead of building 14" and 16" every month, the company would frequently double up on lot sizes and build all 14's in one month and 16's the next. Under the worst situation, a customer may have to wait an extra month for his lathe to be delivered, which would not be an intolerable delay in good economic times. What this did was to allow production levels of those two models to approach 100 lathes each in alternate months - an unheard of volume up until then.

Had Charles Davis not died suddenly a few years earlier, Lodge would have gladly invited him in to see what Davis once described as an *impossible dream* - an assembly floor with 100 lathes of the same size under construction. In the twilight of an entrepreneurial career, what more gratification could one expect than the superb success of one's company, and the universal recognition by peers.

## Epilogue

William Lodge died suddenly of a stroke at 68 years of age on Monday, April 30, 1917, but not before witnessing exceptionally prosperous years at Lodge & Shipley. As a result of the outbreak of World War I in 1914 and surging European demand for Lodge products, the company was overwhelmed with business. But most importantly, the application of the so-called *American System* of lathe manufacturing - with its simple concept of interchangeable parts for all lathes of the same size, and the specification of production into the character of work - created massive economies of size. The *American System* had made it possible for workers to specialize. And aside from substantially improving efficiency, the system produced lathes that were more identical and far more precise. This consistency and precision gave the company a huge competitive advantage.

The existing manufacturing system in widespread use throughout the world in the 1880s was more cumbersome and less exact. A small team of workers had machined, ground, filed, assembled, and fitted individual parts to make a complete machine. Similar sized lathes may have looked the same, but a tailstock spindle on one, for example, might not have matched another because of the individual fitting done at assembly by a different team.

Evidence of the company's success during those years is best illustrated by the fact that from 1915 to 1918 dividend payments alone totaled \$1.6 million, which would be the current equivalent of nearly \$40 million. While a portion of these dividend payments went to pay down bank debt and buy out two shareholders, the absence of any measurable income taxes at the time did not encourage keeping surplus cash in the company. The estimated sales over those four years was probably less than \$10 million, so one can surmise that gross margins may have been in the 35-40% range, similar to those of IBM, Microsoft and other leading computer software companies in their banner years.

The implementation of the *American System* to the manufacture of lathes was the primary reason for this extraordinary success. The company was producing 1,500-2,000 lathes a year at the time, which would have been an impossible level of production 25 years earlier, and at a level where maximum benefit was possible from the system. However, later in the century when production of computerized and specialized lathes was only a tenth of that level, the *American System* and its surrounding corporate culture was a real albatross for Lodge

and other machine tool manufacturers whose plants were geared for higher volumes.

On a relative basis, Lodge sold a new 20" swing cone head lathe in the early 1900s for \$750-1,000, which would be the equivalent of \$25,000 a century later. Although CNC lathes of similar capacity were selling for less than \$250,000 nearly 100 years later, they were 20-40 times more productive than the old cone head versions.

These unit and dollar illustrations are intended to give the reader a better understanding of the economics of machine tool production in the early 20th century compared with today's world.

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