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ELECTRIFICATION OF UTAH 1880 TO 1915

by

Boyd L. Dastrup

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF ARTS

in

History

Approved:

Major Professor

~~Committee~~ Member

Committee Member

Dean of Graduate Studies

UTAH STATE UNIVERSITY
Logan, Utah

1976

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Boyd L. Dastrup

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ABSTRACT

Electrification of Utah 1880 to 1915

by

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Utah State University, 1976

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Department: History

Invented in the 1870's, practical electric lighting systems and the electric power industry immediately began to spread. At first electricity was limited to public and domestic lighting. Soon, it was applied to transportation when streetcars and interurbans were electrified. Later, industry, in particular the mining industry, adopted electricity as a source of power, and the profits and efficiency increased significantly.

In Utah electrification began as early as 1880. In that year the state's first electric power company was incorporated in Salt Lake City. Soon, Ogden, Logan, Provo, and other towns began harnessing electricity. Shortly thereafter, electric streetcars began to run in the state's major cities and interurban lines connected towns along the Wasatch Front. Simultaneously, electricity was introduced into the mines, and greatly improved their productivity.

(116 pages)

PROLOGUE

During the last three decades of the Nineteenth Century and the first decade of the Twentieth Century, America's economy changed rapidly from agrarian to industrial. Big business emerged as a natural phenomenon and exploited the natural resources. Coal, petroleum, steel and eventually electricity were used to forge an industrialized country.

The electrification of Utah was a highly complex process and an intregal phase in the industrial development of the state. During the transition to electricity, many small and independent companies emerged along the Wasatch Front and in remote areas of the state. Struggling against nature, primitive technology, each other, and inadequate financial resources, many collapsed or were bought by larger companies initiating an intricate pattern of consolidation. Soon the electricity produced by Utah's power companies became vital in the state's industry and transportation and was eventually the basis of the industrial revolution of the late Nineteenth and early Twentieth Centuries in Utah.

The purpose of this thesis will be to tell the story of the electrification of Utah from 1880 to 1915. The period was one of technical and corporate experimentation to solve the problems of power production and distribution. The incorporation of the Utah Power and Light Company in 1912 marked the end of the first era. Particular attention will be paid to the men and the power companies that brought the benefits of electricity to Utah. It will also be a story

of the evolution of an industry from a primitive state to one of considerable sophistication.

CHAPTER I

EUROPEAN AND AMERICAN INFLUENCES UPON UTAH

Introduction

The decade of the 1870s witnessed many changes in Utah. With the completion of the transcontinental railroad in 1869 and with the improvements in communications, Utah merged quickly with the United States. Outside influences were thus felt strongly only after Ogden became the junction for the railroad and the telegraph. New technology entered into the territory as the industrial revolution spread. The Mormons under Brigham Young's leadership responded enthusiastically to the changes in technology but with less enthusiasm for the social changes they brought. Through the use of the new inventions, they believed that they could spread the kingdom of God more rapidly and effectively. In contrast, the Gentiles (a Mormon term for all non-Mormons) saw the material advantages being introduced by industrialization. They desired the wealth and the prestige that the industrial revolution would bring. As a result, mines opened, and a railroad system was extended through the territory. In Salt Lake City a horse-drawn streetcar system was built. In addition, telephone lines were strung in Ogden and Salt Lake City. Further, the people made every effort to keep abreast of the rest of the country by obtaining the numerous inventions patented in the United States and Europe.

One of the most glamorous inventions was the electric light. As early as 1876 the electric light had attracted Utahns' attention. Because of Paul Jablockhoff's, Charles F. Brush's and, of course,

Thomas A. Edison's outstanding work, Utahns recognized the utilitarian value of the light and naturally wanted it to illuminate their streets and public places. Their obsession for the new light was compounded as they read about cities like Paris, Rome, London, and even New York City replacing gas and oil lamps with electricity to illuminate streets, harbors, and public places. Besides outdoor uses, they read about the light being adapted for domestic purposes.

European developments

In Europe the light's adaptation was based upon the earlier improvement of the electric dynamo by Z.T. Gramme, a Belgian residing in Paris, France. Gramme increased the efficiency of the dynamo or electric generator replacing the battery as a source of power. The dynamo generated electricity by an armature wrapped with coils of wire and rotated through the magnetic field of a magnet. Usually, a waterwheel or steam engine provided the required energy to rotate the armature. The dynamo not only simplified the generation of electricity but also reduced the costs of production. Consequently, the electric light became competitive in the field of illumination.¹

However, it was not until Paul Jablochhoff's invention of a more efficient light that the domination of gas, tallow, and oil lamps was really broken. His lamp like the earlier ones depended upon an electric spark between two carbon poles to create a light, hence the name, arc light (Figure 1). Together, the dynamo and the Jablochhoff lamp proved to be better than gas lamps.

¹U.S., Department of Commerce and Labor, Bureau of the Census, Special Reports, Central Electric Light and Power Stations: 1902, p. 88.

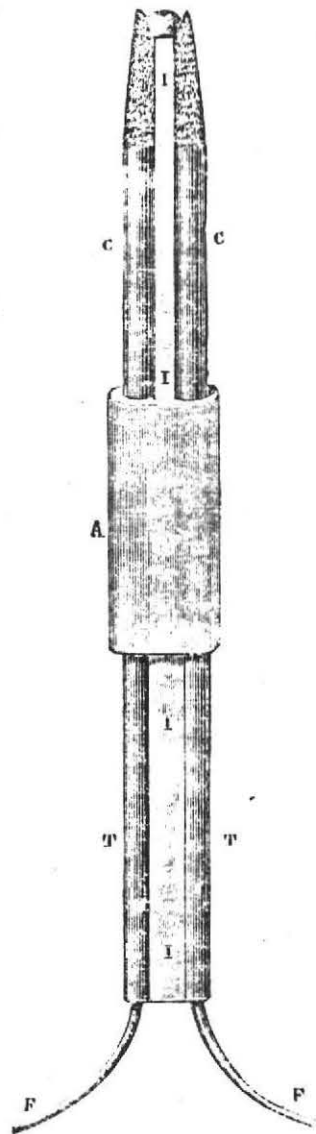


Figure 1. Actual size of Jablochkoff Candle with C,C as the carbon points, I,I as the insulating material, T,T as the tubes holding the carbon points, A as the socket of abestos holding the system together, and F,F as the copper wires conveying the electric current.

As a result of Jablochhoff's success, electric lights were soon burning along the streets of European cities. An electric light was first used in Paris in 1878 when it illuminated the Avenue de l' Opera, the Tuileries Garden, the Arc de Triumphe, and the Gare-St. Lazare Railway Station. This stimulated interest in other European cities. By the end of 1878, arc lamps lighted portions of London. The first area to be lighted was along the Thames Embankment from the Westminster Bridge to the Waterloo Bridge. The next year twenty additional lights were erected along the Thames Embankment which extended the portion lighted by electric lights to Blackfriars Bridge.² In 1879 the British Museum, the Waterloo Palace, and the Victoria Railway Station were lighted for the first time with electricity. During those same years, many London businessmen began adopting the arc lamp to light the interiors and the exteriors of their business establishments.³ In the late 1870s and early 1880s, other cities including Liverpool, Manchester, and Birmingham, England, also adopted electricity. In Italy, Rome also recognized the advantages of the wonderful new light and proposed to light streets and public places in the city.

Thus far, Europeans had accomplished more in the field of electrical illumination than Americans. In fact, during the 1870s the gap between Europe and the United States widened. German, French, Russian, and British inventors made fairly efficient dynamos and arc lights to illuminate bridges, railway stations, theaters, circuses, engineering

²"The Jablochhoff Electric Light in London," Popular Science Monthly, 17 (May to October 1880): 706.

³"Timely Topics in London," New York Times, February 17, 1878, p. 2.

and industrial works, hotels, and private residences.⁴ It was only in 1878 that some enterprising American scientists and inventors entered the field.

American contributions

Charles F. Brush was one of the first Americans to break the European domination when he patented a dynamo and arc light in 1878. Because his light and dynamo were designed to work together, it was called a system. Furthermore, no one before had constructed a system that consisted of a generator and a lamp developed specifically to function together. In addition, Brush introduced a new style of lamp posts. Besides placing lamps on short poles similiar to the gas light posts of the era, he erected lights on the top of lofty two hundred-foot metal and wooden tripod or quadrapod towers to give the effect of subdued moonlight.⁵ In contrast, the light from lamps atop short poles was bright rather than soft.

One of the first cities to see Brush's system operate was Cleveland, Ohio, where he gave a public exhibition on April 21, 1878, at the Union Steel Screw Company. It included a Brush generator and four lamps. Two lamps were installed on the third floor, and two were placed on the fourth floor of the Union Steel Screw Building. The exhibition was highly successful and exciting though by modern standards it was primitive indeed. An article attributed to the Cleveland Herald in the New York Times said that the effects were brilliant. The rooms in which the experiment was conducted were flooded with a uniform and bright light similiar to the sun's light. The article further stated

⁴"The Jablochhoff Light in London," p. 706.

⁵Central Electric Light and Power Stations: 1902, p. 90.

that it was free from the flickering of the earlier lights.⁶ Because the light was magical and mysterious as well as intriguing, other American cities clamored for his wonderful invention. In 1878 John Wanamaker of Philadelphia contracted with Brush for twenty arc lights for his new store in Philadelphia.⁷ In 1879 the California Electric Light Company of San Francisco constructed the first central station to use his system. In addition, Palace Hotel in San Francisco and the Constant Thread Company of Pawtucket, Rhode Island, used his system.⁸ Further, before 1879 was over, many manufacturing establishments in New England adopted his light.⁹ In New York City his lamps were lighted for the first time on December 20, 1880, along Broadway. The New York Times wrote that when the blazing electric lights were turned on for the first time people walking along Broadway were startled.¹⁰ Like New York City, Philadelphia was attracted to his system. On December 3, 1881, the Brush Electric Company in Philadelphia turned on the electric street lights for the first time.¹¹ The people in the City of Brotherly Love reacted so favorably that within six months the two electric light companies in the city were authorized to expand. In Wabash,

⁶"Experiments with the Electric Light," Popular Science Monthly, 13 (May to October 1878): 380-81.

⁷Horace P. Liversidge, Electric Light Service in Philadelphia Since 1881, (Princeton: Princeton University Press, 1945), p. 11.

⁸"Electric Illumination," New York Times, June 15, 1879, p. 5.

⁹"Progress of the Electric Light," New York Times, December 8, 1878, p. 6.

¹⁰"New Lights on Broadway," New York Times, December 20, 1880, p. 1.

¹¹Liversidge, pp. 17-18.

Indiana, an enthusiastic supporter declared that because the light was so bright a person standing with a newspaper one-half mile from the Brush tower could read that paper without any problem.¹²

Brush's fame spread beyond the boundaries of his native country when his light and dynamo were introduced in Europe. In England the British Navy was utilizing it by the spring of 1880. In 1881 the Anglo-American Company of London ordered twenty-four generators and 432 lamps from him and bought the British rights to patent his system in England.¹³

In addition, Brush experimented with an indoor arc light and by October 1878 was able to exhibit a small dynamo and light designed explicitly for interior use at the Mechanic's Fair in Boston. One month later, the same dynamo was installed in a Boston clothing store.¹⁴ Even though the clothing store venture may have been successful, he made no attempts to refine the indoor lighting system thinking that lighting small spaces was not practical.¹⁵

Brush received the most acclaim, but others were moving simultaneously to develop their own systems. Elihu Thomson and Edwin J. Houston had invented a practical arc lighting system in 1878.¹⁶ Because Thomson and Houston improved the generator by eliminating the

¹²"Electric Lights for the City," New York Times, April 14, 1881, p. 8.

¹³"A British Order For Electric Lights," New York Times, April 29, 1881, p. 1.

¹⁴Central Electric Light and Power Stations; 1902, p. 90.

¹⁵"Electric Illumination," New York Times, June 15, 1879, p. 5.

¹⁶Henry Schroeder, History of Electric Light, Smithsonian Miscellaneous Collections 76 (Washington D.C.: Smithsonian Institute, 1923): 38.

damaging electric sparks inside it, many people felt that their system was far superior to Brush's.¹⁷ The Brush and Thomson-Houston systems were by all means the most practical and popular, and by 1889 they dominated the electric lighting business in the United States. However, Edward Weston of Newark, New Jersey, William Wallace, and Moses C. Farmer also built systems similar to the others but soon lost their identities in the growing electric lighting industry.¹⁸

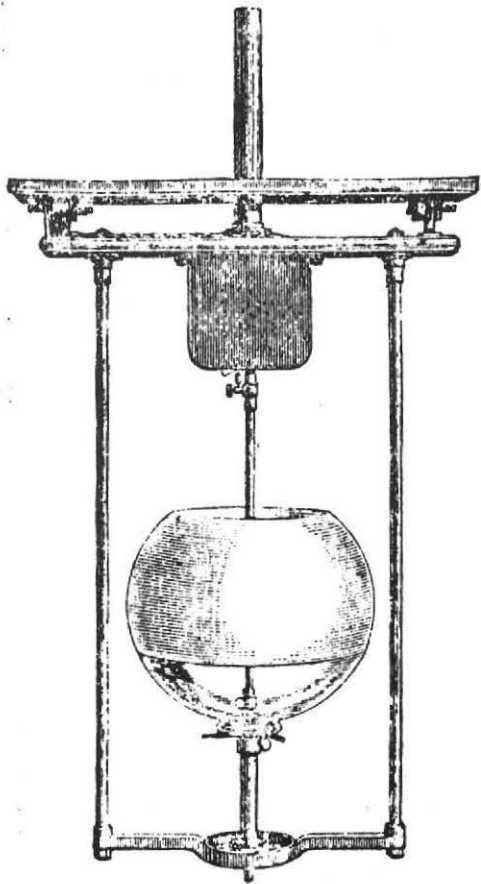
Persistent men like Jablochkoff, Brush, Thomson, and Houston unlocked a new era in the history of illumination. Their arc lamps lighted streets, public squares, and harbors in cities in the United States and Europe. Nevertheless, their systems had several faults. Perhaps the most serious was the possibility of fire from the high voltage required to jump the gap between the carbon sticks in the lamps. This weakness restricted the use of the arc light to open spaces or to large, spacious rooms with high ceilings. Besides being dangerous, the arc light was massive and cumbersome making their use inconvenient (Figure 2). Also, it was more expensive than gas.¹⁹ Finally, it was wired in a series requiring all lights to be turned on at the same time and was consequently unsuited for domestic uses requiring single lights.²⁰ However, there was much optimism that a practical light for domestic purposes would soon be developed.

¹⁷ Malcolm MacLaren, The Rise of the Electrical Industry During the Nineteenth Century, (Princeton: Princeton University Press, 1943), p. 121.

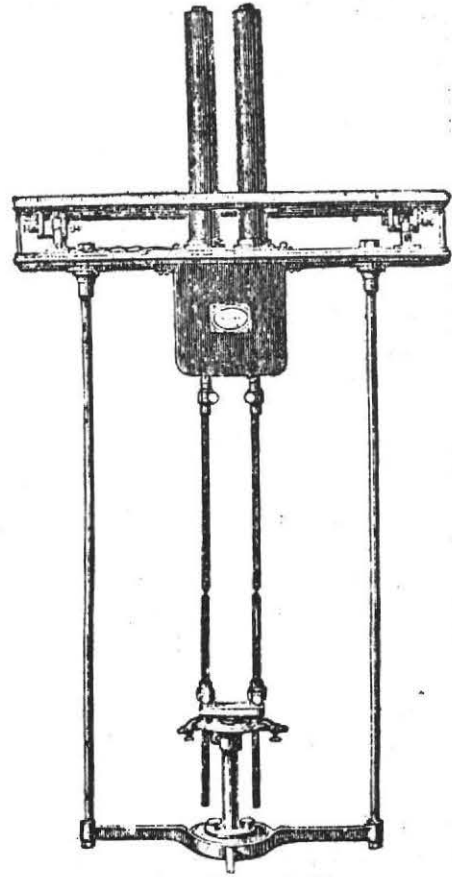
¹⁸ Schroeder, p. 39.

¹⁹ Central Electric Light and Power Stations: 1902, p. 90.

²⁰ Floyd A. Lewis, The Incandescent Light, (New York: Shorewood Publishers Inc., 1949), pp. 32-33.



Brush arc lamp. Single.



Brush arc lamp. Double.

Figure 2. Early types of arc lamps.

That goal was finally realized with the invention of the incandescent light. In contrast to the arc light, the incandescent light did not produce a light by a spark. Rather, it was lighted by heating a filament until it glowed and was made possible by the subdivision of the electric current which allowed the creation of smaller and milder lights. Because they were smaller, they were easily adapted for domestic uses. In addition, they could be controlled individually because they were wired in parallel circuits.²¹ As a result, they were not only less dangerous but also more adaptable to a variety of uses.

Although many qualified and talented scientists experimented with the incandescent light, the incomparable Thomas Alva Edison was generally accredited with making the first successful one. He began his work in 1877 and applied for his first patent in October 1878 which was finally granted in April 1879. His first lamp used a platinum filament, but platinum proved to be unreliable. To solve the problem he continued to experiment to find a more suitable material. His first successful light, which had a carbon filament sealed inside a glass bulb, was completed in October of that same year.²² With a promoter's gleam in his eye, he announced that the light required no shade or screen to modify its intensity as its predecessors did and that it could be gazed upon without dazzling the eyes.

Throughout all of his experiments, he was confident that he could make an electric light that would be available for household uses.

²¹ Ibid.

²² Laclaren, pp. 74-76.

His self-assurance generated enthusiasm in some and fear and panic in others. His most ardent supporters were the editors of the New York Times who wrote on December 28, 1879, that he had succeeded in making an inexpensive light that was adaptable to household purposes. Another enthusiast was Dr. F.G. Fairfield of the New York College of Veterinary Surgeons. He declared that Edison's light was more advanced than his competitors and that the light was clear, steady, and white without the bluish tinge that rendered other electric lights unsatisfactory.²³ Reacting to both Edison's confidence and his achievement, the owners of gas stocks in London panicked fearing their stocks would become worthless as a result of his work.²⁴ Other antagonists included electricians in Cleveland who doubted the economical aspects of his lights. They believed it would require a large plant to generate electricity for a large city; therefore, his concept would be impractical.²⁵ Even in such remote areas as Utah, people joined in denouncing Edison's invention. There, some sarcastically asserted that the new gadget was not so astounding because gas lights were still better and cheaper.

While Edison was working at his Menlo Park laboratory to perfect his light, friends and speculators organized the Edison Electric Light Company. The first commercial application of his light was in May 1880 on the steamship, S.S. Columbia of the Oregon Railway and Navigation Company. One year later at the Paris Exposition of 1881, he introduced another invention when he displayed his "Jumbo" generator for the first

²³"Menlo Park Laboratory," New York Times, February 16, 1880, p. 3.

²⁴New York Times, November 3, 1878, p. 4.

²⁵"Light a Great City," New York Times, February 7, 1880, p. 3.

time. At the time it was the world's largest. The Paris Exposition gave Edison his first worldwide exposure. A short time thereafter he unveiled another first in London. In January 1882, the first large-scale operation of his system began along the Holborn Viaduct when his "Jumbo" generator and lights were turned on. However, Edison's crowning achievement in this period was the Pearl Street Station in New York City which began operations on September 4, 1882.²⁶ It marked the beginning in the United States of large-scale public lighting. In addition, his "Jumbo" generator was the forerunner of the modern electric power station.

Another American, William E. Sawyer experimented with the incandescent light and was able to demonstrate his light in the winter of 1880 at New York City. His demonstration did much to prove the practicality of interior illumination with incandescent lighting. Furthermore, an innovation that he introduced was a knob on the lamp that regulated the brightness of the light. By turning the knob in the desired direction, a person controlled the light's brightness. Shortly thereafter, the Eastern Electric Manufacturing Company was formed to market his light.²⁷ Until he invented a light that could be regulated, the Deseret Evening News in Salt Lake City had stubbornly maintained that the incandescent light was impractical. Thereafter, the paper became a staunch supporter of incandescent lighting.*

The pioneers of the electric lighting industry faced many criticisms. One, to which they were particularly vulnerable, was the danger

²⁶Lewis, pp. 71-74.

²⁷"A Light to Read By," New York Times, March 17, 1880, p. 2.

of the light. An article in the New York Times declared that the arc and incandescent lights were not sufficiently safe to render the oil and tallow lamps obsolete. Many newspaper articles including those in Utah told of instances where people were shocked by carelessly touching bare wires. Many were electrocuted and died. Others were concerned about the possibilities of fires caused by the electric wires. The fear of fires and electrocution was a paramount question because at the time because bare wires were strung in the building.²⁸

Nonetheless, the admirers of the light were equal to the opposition by meeting all verbal charges and more important providing backing for the development of the light. For example, the City of Rome boasted that she would look romantic under the electric light. In addition, Roman supporters promised that the electric lighting would reduce crime in the city. As indicated by numerous newspapers and periodical articles, many people recognized the distinct advantages of the electric light over the smoky gas, oil, or tallow lamps and were eager to acquire it. Another proof of the popularity of the new light was the rapid increase in the number of electric light stations from 1881 to 1882 in the United States. Those years showed a remarkable increase of twenty-seven stations which was taken to be any electric lighting facility that furnished electricity whether it utilized Brush's, Edison's, or any other system. Furthermore, the increase was not peculiar to one locale. It was distributed throughout the country. However, the East dominated the movement because it built the most stations. Cities and towns throughout the country

²⁸"The Risks of Electric Lighting," New York Times, March 26, 1882, p. 8.

recognized that if they were to be progressive and modern in the industrial revolution they must adopt some of the new inventions.

Utah's cities were among those that recognized the value of the light. However, Utahns had little opportunity to see electric lighting. Before 1880 they had only read about Brush's, Edison's, and other inventor's electric lights, but in that year their situation changed when they saw electric light exhibitions on two separate occasions. The first time was when the Cole Brother's Circus traveled to Utah and brought an electric light with it. Salt Lake City newspapers billed the electric light as sun eclipsing and the greatest show that ever dared to cross the Great Divide. The second showing was when two Brush electric lights were installed at the Zion Cooperative Merchantile Institution (ZCMI) in Salt Lake City. Those two exhibitions confirmed what had been read in the papers and had been heard from travelers who had seen the electric light. It was indeed magnificent and brilliant to behold. As a result, Utahn's cravings for the new light heightened inducing them to search for the means to light their cities with electricity.

In the preceding half dozen years the electric light had progressed tremendously. After the invention of the dynamo, a new era in illumination had emerged. The combined efforts of Paul Jablochhoff, Charles F. Brush, and Thomas A. Edison proved that oil, gas, and tallow lamps were not the only practical means to light streets, harbors, and public squares. The revolution that began in Europe crossed the Atlantic Ocean to the United States and finally penetrated Utah.

CHAPTER II

SALT LAKE CITY AND OGDEN: THE LEADERS

Introduction

Shortly after the 1880 exhibitions two power companies were founded beginning a series of power companies that served and competed against each other in the Salt Lake City and Ogden areas. By 1895 a total of five companies provided electricity in Salt Lake City and Ogden. However, a depression in the **mid-1890's forced them to merge** founding one large company. From that point forward only one major company generated electricity for lights, heating, and power for Utah's two largest cities with little competition from any other electric companies.

Because those companies were new to the electric power industry and because the industry, itself, was new, many difficulties faced them. One of the first problems was the dearth of knowledge concerning electricity. Techniques of generating were primitive. Nature was also a continuing problem. Floods, snow, and ice as well as drought plagued the early electric companies. Further, the developing technology of generating and distributing electricity required the outlay of vast sums of money, and many companies folded because they lacked sufficient capital. Nevertheless, interest remained high in light and power investment opportunities.

The men who invested money in the emerging industry were pioneers in their own right. Men like G.S. Erb, William S. McCormick, Joseph F.

Smith, George W. Cannon, and many others gave strength and character to the business as it grew in Salt Lake City and Ogden. Through their steady influence, they lifted sagging companies and gave them the will to survive. Without them Utah's entrance into the wonders of electricity would have been delayed. However, the transition was also aided by entrepreneurs outside Utah.

Growing pains

Outstanding among those entrepreneurs was Charles C. Rauthrauff, an agent for the Brush Electric Company of Denver. In 1880 he effectively introduced electricity to Salt Lake City when he approached the city council to discuss the possibility of installing an electric street lighting system. He used various techniques to sell the council which was reluctant at first to consider his proposition and played upon local pride by pointing out that not only would Salt Lake City be the first city in Utah to be lighted from a central facility but also the fifth in the entire world.¹ His pitch was backed up by an exhibition at the Horn Silver Mine west of Milford, Utah. As it turned out, the exhibition dispelled all doubts and with local newspapers writing optimistic accounts of both the exhibition and Salt Lake City's prospects, G.S. Erb, Henry W. Lawrence, and W.L. Hoge, all prominent Salt Lake City businessmen, organized the city's first power company, the Salt Lake Power, Light and Heating Company.

The electric company began business in November 1880 and shortly thereafter initiated construction of a steam plant on Second South

¹"The First Electric Light Seen in Salt Lake At Circus," Deseret News (Salt Lake City), June 6, 1947.

Street near West Temple in Salt Lake City. The plant was 30 feet by 70 feet and housed four sixty-horsepower boilers fired by coal which operated a Buckeye engine and a Brush arc machine. Pushing ahead the company had its light poles up by March 1881 and ran wiring in three separate circuits in the business district where a few street lights were illuminated and a few select customers were provided with electricity to light their stores. On March 31 the system was turned on amidst a festive and attentive atmosphere. Thus, Salt Lake City now ranked among the leading cities of the country.

During the company's first year of operation, it met considerable difficulty. As early as June 1881 city residents complained because the company did not light the electric street lamps on Sunday. Evidently, after just two months the light had come to be more than a luxury. Succumbing to the public's wishes, the company started to operate what it called its "Sunday Circuit" burning thirty to forty lights each Sunday. In the same month its boilers failed when they leaked extinguishing the fires under them forcing the company to close down until new boilers were procured. To prevent a repetition of that problem, the company installed a double set of boilers so if one was inoperable the second set could be used. In April 1882 the city council compounded the company's plight when it declined to have more electric street lights installed until they were more popular in other cities in the United States. Nevertheless, those early problems did not deter the quest for more and better service.

From 1882 to 1893 the Salt Lake Power, Light and Heating Company's capacity to generate electricity continued to be improved; consequently it offered more competition to the Salt Lake Gas Company which was

providing the city with gas street lights along the city's principle streets. In the years after 1882 the city council acquiesced on the electric street lighting issue, and more electric lights were erected. Expansion continued for the next several years, and in 1887 an entirely new system was added when the company signed a contract with the Heisler Incandescent Light Company of St. Louis, Missouri, to furnish the Salt Lake City company with its incandescent lighting system. The incandescent system was installed and was so successful that the company extended its service to 2:00 A.M.² Sensing the wave of the future, the Salt Lake Gas Company bought 1400 shares of the electric company in 1889. Shortly thereafter, the electric company with the gas company's assistance completely replaced the gas street lights with electricity. Economy was achieved by adopting a moonlight schedule which meant that the lights were turned on only when the moon did not shine. After Frank H. Dyer, the former United States marshal for Utah, and his associates gained control of the company in 1890, the company continued to grow. Under his astute guidance the company expanded by adding new machinery, building a new power station, and introducing the Edison incandescent lighting system and the Thomson-Houston arc lighting system.

To the Salt Lake Tribune it seemed that the Salt Lake Power, Light and Heating Company outshone any other power company in the United States. Indeed, the Tribune proclaimed that the company was the second largest power company in the country saying only New York City's power

² Salt Lake Power, Light and Heating Company, Minutes of Board of Directors, May 18, 1887, located in "Salt Lake Power, Light and Heating Company Historical File," Utah Power and Light Central Files, Salt Lake City, Utah.

company was larger. In its enthusiasm the city even claimed to be the best lighted city in the nation. However, those assertions were dubious because New York, San Francisco, and Cleveland could boast bigger power companies and better lighting facilities.

While the newspaper and the city bragged about the electric company, it was facing severe problems by 1893. Not only did the nationwide depression affect it but also its machinery was deteriorating and needed to be replaced. To overcome these problems it merged with the Ogden Electric Light Company, which was organized in 1881, to form the Salt Lake and Ogden Gas and Electric Company.

With Salt Lake City enjoying the first fruits of electric lights, Charles C. Rauthrauff offered in late 1880 to light Ogden with electricity. The city council readily accepted his proposition and signed a contract with him. To the council's dismay he returned to Denver, Colorado, without fulfilling his obligation. As a result, the city council voided the agreement and awarded it to G.S. Erb, Rauthrauff's former partner.³

After Erb had directed the construction of a power plant and the erection of a 127-foot quadrupod steel tower with four twenty-five foot extension arms radiating from the top of the huge structure, he and James Horrocks organized the Ogden Electric Light Company and prepared to begin business. On May 19, 1881, the citizens of Ogden witnessed the illumination of the first electric light in Ogden. The crowd which had assembled near the tower greeted the advent of the electric light with music and wild cheers. Those in the immediate

³Ogden City, City Council, Corporation Minute Book, Vol., E., p. 211.

vicinity of the tower were satisfied with the experiment, the machinery, and the light bulbs; but those farther back from the tower failed to appreciate the significance of the evening.⁴

The exhibition provided the necessary impetus, and the company began at once to expand its operations. By the fall of 1881, it had installed one large tower at the intersection of each of Ogden's main thoroughfares.⁵ Although towers similar to those used in Ogden were already being used in New York City, Cleveland, New Orleans, and Detroit, they proved to be expensive and inadequate. Consequently, short poles like gas light poles replaced the huge towers in Ogden and elsewhere.⁶ By 1883 the Ogden company provided electricity for thirty-six private lights and nine street lights including those lights erected in 1881.

To meet increasing demands, the company constructed a hydroelectric plant in May 1883 at the mouth of Ogden Canyon which was one of the first attempts in Utah to use water rather than steam to generate electricity. In 1887 the company remodeled the hydroelectric plant by installing a Heisler incandescent system and new generating facilities which had a capacity of 400 thirty-candlepower lamps and stretched power lines from the plant over thirty miles throughout Ogden. Unable to meet the growing demands for electricity, the

⁴"Ogden Sees the First Electric Light Illumination," Ogden Daily Herald, May 20, 1881.

⁵Corporation Minute Book, Vol., E., p. 331.

⁶U.S., Department of Commerce and Labor, Bureau of the Census, Special Reports, Central Electric Light and Power Stations: 1902, p. 99.

hydroelectric plant was closed down in 1891 when a new steam plant on Twentieth Street and Wall Avenue replaced it.

However, the Ogden company faced difficult times in the 1880's like its counterpart in Salt Lake City. In the winter months water frequently froze in the water pipes which supplied the boilers making generating impossible. Equally serious was the fact that stream flow fell due to ice in the winter and drought in the summer leaving insufficient power to turn the wheel. The city council became so incensed with resulting blackouts in 1882 and 1883 that it gave the company sixty days to improve its service. If the company failed to meet the demands, the city council threatened to cancel its contract. To appease the city council, the company installed nine additional street lamps in the city at no cost. However, the problem of sufficient water flow and blackouts continued.

In the early 1890's a new problem arose to challenge Ogden Electric Company's monopoly when Frank L. Priestly organized a competing company, the Citizens Electric Light Company of Ogden. Nevertheless, the Ogden Electric Light Company did not surrender its monopoly without a fight. Before the new company could put its plant into operation, the Ogden Electric company filed a restraining order against it in November 1890. The older company intended to prevent the new rival from obtaining a franchise from the city. However, this effort was unsuccessful, and the Citizens Electric Light Company began operations in January 1891.

Ironically, the Citizens Electric controversy was just the start of a series of problems for both companies which ultimately forced them to turn the management of their affairs over to the newly formed

Ogden Gas, Light and Fuel Company in 1891. As a result, a single company monopolized the electric lighting industry in Ogden again. The Ogden Gas, Light and Fuel Company provided indifferent service until it merged with the Salt Lake Power, Light and Heating Company in 1893 to form the Salt Lake and Ogden Gas and Electric Company.

The life of the Salt Lake and Ogden Gas and Electric Company was short and filled with problems most of which were only indirectly related to the quality of its service. Mainly, they were petty annoyances. For example, the Salt Lake City engineer reported that the electric light poles would destroy the trees if they were placed on the street curbs. To remedy this the company placed light poles in the center of the streets in Salt Lake City like they were in Ogden (Figure 3). This in turn created another controversy because people with a love for esthetics felt that the poles and wires disfigured the streets. Besides that issue, smoke from the company's coal-stoked plant in downtown Salt Lake City created a nuisance in the business district. Also, the Ogden branch of the company was irritated because the company's general offices were located in Salt Lake City rather than Ogden. In addition, the company desperately needed new equipment; but due to the Depression of 1893, it was unable to purchase new machinery. A final problem that compelled the Salt Lake and Ogden Gas and Electric Company to dissolve was the incorporation of hydroelectric companies in Salt Lake City and Ogden. Because the Salt Lake and Ogden company was unable to compete against the hydroelectric companies superior product, it merged with them forming the Union Light and Power Company.⁷

⁷"Salt Lake and Ogden Gas and Electric Company Historical File," Corporate History, Utah Power and Light Central Files.



Figure 3. Picture of 25th and Washington in the late 1880s with a street light in the center of the intersection.

Early hydroelectric power companies
in Salt Lake City and Ogden

In the early 1890s the promoters of the electric power industry in Salt Lake City and Ogden began a search for an alternative to steam as a source of power. Because Utah had many mountain streams, it appeared that water was the logical successor to steam; but it took an outside impetus to develop the untapped water sources along the Wasatch Front. In 1893 the successful construction and the subsequent operation of the West's first large hydroelectric plant in Redlands, California, prompted men in Utah to consider hydroelectric power. Within a month Utah's first large-scale hydroelectric company, the Pioneer Electric Power Company, was formed and fittingly it was organized in Ogden where the state's first but unsuccessful hydroelectric plant was built ten years earlier in 1883.

Recognizing the enormous potential of hydroelectric power in Ogden Canyon, George Q. Cannon and Fred J. Kiesel organized the Pioneer Electric Power Company of Ogden in 1893. By building a dam across the Ogden River and erecting a powerhouse, they hoped to make Ogden the most progressive city in Utah by utilizing water for irrigation and the generation of electricity.

Local citizens and city officials shared those same dreams. City leaders visualized Ogden as becoming the queen city of the state and the industrial capital of the Intermountain West by capturing the concentration of brains, capital, and wealth that presently resided in Salt Lake City. To some Ogdenites the formation of

the Pioneer Electric Power Company seemed to remove the last barrier that stood in the way of Ogden's future growth.⁸

While the citizens of Ogden and the city council were extolling the possibilities of the enormous project, company representatives sought financial support for the project. In May 1894 George Q. Cannon, a prominent Mormon leader, and Frank J. Cannon returned from New York City with George A. Purbeck of Purbeck and Company of New York and Colonel Thomas, a consulting engineer for the New York Elevated Railroad. Together with Wilford Woodruff, the president of the Mormon church, they discussed various proposals to raise the necessary capital. Because the project impressed Purbeck and King, they signed a contract to act as financial agents. But in February 1895, the company cancelled their contract and opened negotiations with Tracy McDonald and Company. The talks with Tracy McDonald and Company also collapsed. Finally, Joseph Bannigan, a Rhode Island engineer, rescued the company when he invested 1.5 million dollars in it.

In the meantime, construction began. A temporary dam near Wheeler's Canyon in Ogden Canyon was quickly built so the company could start generating electricity and storing water for irrigation by 1897. A permanent dam was finished in 1898, and the temporary dam was dismantled. A powerhouse was erected near the mouth of Ogden Canyon, and a pipeline was laid along the north wall of Ogden Canyon connecting the dam and the powerhouse and furnishing the necessary water to run the generators. Because the company faced

⁸"A Grand Enterprise," Ogden Standard, November 28, 1893, p. 1.

a difficult task when they laid the pipeline, the Ogden Standard described the accomplishment as a "superhuman feat."⁹

What the Pioneer Electric Power Company did for Ogden, the Mormon-promoted Big Cottonwood Power Company hoped to do for Salt Lake City. Soon after incorporation, it became entangled in a struggle for street lighting franchises in the capital city. By underbidding the Salt Lake and Ogden Gas and Electric Company it hoped to monopolize the electric power industry in Salt Lake City. Its plans collapsed when it was forced to lease power lines, light poles, and lamps from the older company. The Big Cottonwood company later fought with the Pioneer Electric Power Company, but this time it won when Pioneer Electric decided to bypass Salt Lake City when it built its line from Ogden to the smelters in Sandy.

In 1895 and 1896 two new hydroelectric power companies entered the Salt Lake City area when the Citizens Electric Light Company of Salt Lake City and the Little Cottonwood Power Company were incorporated. Neither made any significant contributions to the growing industry and were soon absorbed by the larger electric companies in the vicinity. However, the Citizens company did fight a bitter rate war with the Salt Lake and Ogden company that lasted until Citizens sold out to it in 1897.¹⁰

The depression years from 1893 to 1897 were difficult for Utah's electric power companies. As a result of hard times, Pioneer Electric Power Company, the Big Cottonwood Power Company, the Salt Lake

⁹"Pioneer Electric Power Company," Ogden Standard, October 19, 1896.

¹⁰"The Citizens Electric," Salt Lake Tribune, February 21, 1897, p. 1.

and Ogden Gas and Electric Company, the Citizens Electric Light Company, and the Little Cottonwood Power Company merged under the title of the Union Light and Power Company. Avid supporters thought that the new company was the most extensive and complete system in the United States. It was hardly this; however, it was certainly the largest in Utah. It owned two hydroelectric plants and several steam plants in Ogden and Salt Lake City and controlled an area from Ogden on the north to Sandy on the south and had the capacity to expand to Park City, Bingham, and Mercur.¹¹

It appeared that Union Light and Power would enjoy a prosperous future, but competition for lighting contracts in Salt Lake City and financial and technical difficulties hampered the stability of the company. Frequent clashes for street lighting franchises in Salt Lake City with the newly organized Utah Power Company of Salt Lake City cost it several street lighting contracts when Utah Power successfully underbid it. Furthermore, its revenue consistently fell short of the financial costs to maintain the system, and technical adversities caused frequent interruptions and delays in service.¹² This situation continued until it was recognized that reorganization was imperative.

In December 1899 Union Light and Power was reorganized forming the Utah Light and Power Company. Immediately, the new company commenced modernizing and expanding. By replacing its direct current arc street lamps with alternating current lamps, it felt its system

¹¹"Electric Power," Salt Lake Tribune, January 1, 1898, p. 3.

¹²Leonard J. Arrington, Great Basin Kingdom, (Lincoln, University of Nebraska Press, Bison Books, 1966), p. 398.

was as good as any in the United States.¹³ In 1903 it increased the power of its West Temple Street Station by adding three new boilers. Later the same year the company erected a new plant in Ogden Canyon. In addition, it reached an agreement with the Garland Sugar Factory (Utah Sugar Factory) in Northern Utah to supply its surplus power from its new 2,500 horsepower generator in its hydroelectric plant on the Bear River. A power line was then built in 1903 from Garland to Ogden where it was connected with Utah Light and Power's lines. Lines were later extended to Garland, Tremonton, Cache Junction, and all of Box Elder County.¹⁴ In 1904, it merged with Consolidated Railway of Salt Lake City to form the Utah Light and Railway, one of the largest power companies in Utah.

By the end of 1906 the Utah Light and Railway owned a good system. It operated three hydroelectric plants and received additional power from the Utah Sugar Factory and the Telluride Power Company's plants in Logan and Provo. Its power lines were vastly improved so that service was provided without the irritating interruptions of the past. Further, one hundred new arc street lights were erected in Salt Lake City and Ogden.

Nonetheless, those years had their troubles. The rapid growth of Salt Lake City made it imperative that a great sum of money be spent in order to meet the needs of the expanding city. The owners — the Mormon church, English investors, and Alfred W. McCune — did

¹³"Utah Light and Power Historical File," Corporate History, Utah Power and Light Central Files.

¹⁴J.C. Wheelon, "General Report on the Holdings of the Utah-Idaho Sugar Company on the Bear River," dated November 15, 1912, located in "Utah-Idaho Sugar Company Historical File," Utah Power and Light Central Files.

not have sufficient capital to initiate such a tremendous program. Therefore, they sought assistance from outside sources. In 1906 the financial means were obtained when Edward H. Harriman, the Union Pacific Railroad magnate, bought the controlling interests in the company.¹⁵

The Harriman years

Under Harriman's direction the company embarked upon an ambitious rebuilding program. It built a new hydroelectric plant in Weber Canyon near Devil's Gate which equaled the output of the Ogden Canyon plant. New power lines were built from the Weber Canyon plant to Salt Lake City to distribute the additional power. At that time tripod or quadrapod steel towers replaced the old wooden ones. In Big Cottonwood Canyon the company built a new concrete dam and added new transformers. Throughout Salt Lake City steel light poles replaced the old wooden ones. Furthermore, a new enclosed luminous arc street lighting system supplanted the old carbon arc lamps. The new street lamps spread the light farther horizontally and gave more coverage than the carbon arc lamps.¹⁶ In Ogden tungsten incandescent street lamps were installed and by 1912 over five thousand tungsten street lights were used in Utah as compared to approximately three hundred arc lights.¹⁷

¹⁵Salt Lake Tribune, October 3, 1906, p. 12.

¹⁶"What Railroads Have Done in 1908," Salt Lake Tribune, January 3, 1909, p. 77.

¹⁷U.S. Department of Commerce and Labor, Bureau of the Census, Special Reports, Central Light and Power Stations: 1912, p. 59.

Like other progressive companies, Utah Light and Railway replaced the old flat rate system which fixed an arbitrary price per lamp with the meter system which charged on the amount of electricity used and billed the customer according to his consumption of electricity. This conversion throughout the United States and in Salt Lake City and Ogden was probably due to the use of new appliances like stoves, washing machines, and flat irons which consumed more electricity than lights.

In addition to rehabilitating the system, Utah Light and Railway expanded its service into an area heretofore without electricity. Although Huntsville was situated near the Utah Light and Railway's Ogden Canyon hydroelectric plant, which was built in 1898, the town did not receive electricity until 1907. In that year a line was erected from the Utah Light and Railway plant to Huntsville. Speeches and songs heralded its advent. As the demands for power increased in Huntsville and neighboring towns, lines were strung throughout the area.¹⁸

During the time that Utah Light and Railway was expanding in Salt Lake City and Ogden, three new electric power companies were incorporated in the same territory. The most important was the Merchants Electric Company of Ogden which was organized in 1911 by prominent Ogdenites for the purpose of providing Ogden and Salt Lake City with electricity because they felt that Utah Light and Railway's

¹⁸"Huntsville Now Has Lights," Ogden Standard, February 19, 1907, p. 8.

product was unsatisfactory. Later, the Peterson Electric Company of Huntsville and the Utah Hotel Company were incorporated. Within years after their incorporations all three companies had sold out because their small electric power systems were too expensive to maintain. Thus, attempts to compete in Ogden and Salt Lake City against Utah Light and Railway collapsed.

In 1911 the Utah Light and Railway declared that it was as good as any system in the United States. In some aspects, it felt that its system was superior to most. Those assertions may have been true because of the company's progressive attitude in adopting many of the latest developments in the industry like luminous arc lights, tungsten lamps, steel poles and towers, and meter rates.

Yet within three years it dissolved selling its streetcar system in Salt Lake City to the newly organized Salt Lake Light and Traction Company and its power franchises to Utah Light and Traction and initiating a period of juggling and adjustment that culminated in the establishment of the Utah Power and Light Company. The Salt Lake Light and Traction Company, which was incorporated in August 1914, lasted only one month before its property was purchased by Utah Light and Traction. Although it now controlled the areas formerly dominated by the Utah Light and Railway Company, Utah Light and Traction choose not to stay in the electrical field for long selling its power interests to Utah Power and Light within six months but retaining its Salt Lake City streetcar system until the 1930s.

When the Utah Power and Light Company purchased property from Utah Light and Traction, it closed one era and opened a new one. Prior to the purchase several major companies served Utah. Thereafter, Utah

Power and Light was the **dominant** one. Also, the previous thirty years had observed the transition from coal-oil, gas, and tallow lamps to the first awkward electric lamps and to fairly sophisticated systems. In the beginning small companies served the two major cities in Utah, but eventually they merged and expanded until one company controlled the area north of Salt Lake City. During those years the technology improved with new and better lights and appliances to make people's lives more comfortable.

CHAPTER III

EXPANSION ALONG THE WASATCH FRONT AND INTO THE OUTLYING REGIONS

Introduction

Ogden and Salt Lake City maintained their status as the only cities in Utah with electricity until 1886. In that year Logan entered the electric power revolution, and Provo followed suit four years later. Soon the power companies there rivaled and sometimes even surpassed the companies in Ogden and Salt Lake City. During the same period small companies were also organized elsewhere along the Wasatch Front and in outlying areas in Utah. These small companies believed in cooperation and as a result did not struggle among themselves attempting to monopolize the industry in their localities. This was particularly true in Davis County where several small companies shared the same generating facilities. Even though these companies were small, they were surprisingly progressive because they often adopted the latest advances in the industry as quickly as the larger companies in Logan, Ogden, Salt Lake City, and Provo did.

Logan and Cache Valley

From the time of electricity's advent in Salt Lake City, businessmen in Logan showed more than a passing interest in it. Among the most ardent of these were Gustave Lundberg and Christian Garff who by 1885 had worked out a scheme by which they could adapt the mill race of their planing mill for generating purposes. With this

plan in mind, they approached the city's fathers with a request for a franchise and with an invitation for the city to become co-owners with them in a power company. The city's response was not encouraging. However, it granted an operating franchise, but it refused to give them exclusive rights. Referring to a city statute forbidding the city to purchase stock in a private company, the city turned down the offer to buy into their proposed company. Lundberg and Garff then found interest among private parties and proceeded to organize the Logan Electric Light and Power Company in January 1886.¹ Shortly thereafter, a small Thomson-Houston generator was installed in the Lundberg and Garff planing mill that provided sufficient power to run eighteen street lights in the city. At this point the city reversed its earlier decision, bought half of the company's stock, took control of its operations, and relocated the plant at the site of the former Card Mill (the present location of the Anderson Lumber Company).

The Card Mill plant proved to be incapable of meeting the demands of the growing city, and steps were taken to expand generating facilities. In 1891-92 Christian Garff presented a plan to construct a new city plant. Political opposition crushed his offer, and the plant was not built. When new companies were organized in Logan, the municipal plant was unable to compete against them.

In the 1890s the Logan Power, Light and Heating Company and the Hercules Electric Power Company were incorporated and began competing against the small municipal company for franchises. Because the private companies were more efficient, they were able to offer con-

¹Joel Ricks, ed., History of a Valley, (Logan, Utah: Cache Valley Centennial Commission, 1955), pp. 227-28.

tracts and electric rates at extremely low prices. As a result, the city lost its contract to light the city's streets in 1896 when Hercules Electric Power Company underbid it. Consequently, the city's plant was forced to close. After the closure of the municipal plant, the Logan Power, Light and Heating Company moved into the city's old facilities and remodeled them with a 1300-light capacity generator.

Because of difficulties over the next several years, both the Hercules Electric Power Company and the Logan Power, Light and Heating Company chose to merge in September 1900 and to form the Hercules Power Company.² The apparent function of the new company was to construct a new and larger plant and to erect a power transmission line to Bingham, Utah, south of Salt Lake City. The line was to connect with the one being stretched by the Telluride Power Company of Provo and Colorado. As might be expected, many people in Logan were concerned that the Hercules Power Company was going to merge with the Telluride Power Company. However, their concern came late because in effect the two companies had merged earlier when Lucien L. Nunn, the trustee and general manager of Telluride, had helped with the financing of the Hercules Power Company.

The reorganized Hercules company barely lasted one year. On July 9, 1901, William Story, George Wilson, and Oliver Dean, all of the Telluride Power Company, filed the articles of incorporation for the Logan Power Company.³ Later in the month they bought the

²"Hercules Power Company Historical File," Corporate History, Utah Power and Light Central Files, Salt Lake City, Utah.

³Logan Journal, August 18, 1896.

Hercules Power Company and finished erecting the power line to Bingham in the fall of 1902. Thus, the power company of Logan changed from the local ownership of George W. Thatcher, Moses Thatcher, and other Logan residents to the dynamic leadership of Story, Wilson and Dean.

The new company immediately became embroiled in a rate controversy with the City of Logan. The city felt that the company's rates were too high while the company maintained that they were lower than any other city in the United States.⁴ To solve the problem, Logan offered the power company \$20,000 for its property in June 1902. Rejecting the proposal, the Logan Power Company retaliated by raising its rates. As a result, angry and indignant city fathers seriously explored the possibilities of building a new municipal plant by organizing a special committee to investigate the feasibility of a city plant. The fervor increased, and a movement to build a city-owned plant to furnish power for municipal and private power consumption began. The movement crystalized when the city completed construction of its own hydroelectric plant in 1903.

In the meantime, the Telluride Power Company bought the Logan Power Company in June 1903 and was dragged into the feud. Telluride and the city fought over water rights to the Logan River and over street lighting franchises. Telluride went as far as to threaten to flood the municipal company's plant which was located downstream from its plant. The threat was never carried out, but it was an indi-

⁴Maya M. Fomesbeck, "Municipal Lighting of Logan," (Unpublished Masters Thesis, Utah State University, 1929), p. 8.

cation of the intensity and the determination with which Telluride fought the war.

As a result of those conflicts, civic organizations agitated and campaigned vigorously to sell the power plant. By the late 1920s there was increasingly strong pressure to sell it to the Utah Power and Light Company. However, the sale to Utah Power and Light failed to materialize. Logan maintained its municipal system, and Utah Power and Light was prohibited from selling electricity in the city and to its residents.

While the Logan power companies were struggling, other electric power companies were incorporated in Cache Valley. The Blacksmith Fork Light and Power Company, the High Creek Electric Light and Power Company, and the Wellsville Municipal Distribution System which only retailed electricity for the Telluride Power Company and later Utah Power and Light brought electricity to areas outside of Logan. The High Creek company was the only one to generate electricity. Nonetheless, complaints of poor and irregular service forced it along with the Blacksmith Fork company which never did generate any electricity to sell out to Utah Power and Light. In time all of the companies in the valley except for Logan's municipal company were integrated into Utah Power and Light's growing network losing their individual identity.

Developments in Utah County

In the southern part of Utah County electrification was progressing much like it was in Cache Valley. The first company to be organized was incorporated in Provo, the major city in the area. Later the

Utah County Light and Power Company was established to serve Lehi, American Fork, and Pleasant Grove. In the same period the Jordan River Electric Generating Company was organized in the northern portion of the county.

As mentioned previously, Provo was the first city in Utah County to get electricity. In fact, the process began as early as 1882 when John P. Spears and J.H. Van Horn petitioned the Provo city council to erect electric street lights. For unknown reasons their efforts failed. Two years later, the Provo Electric Light and Power Company (Provo Edison Electric Light Company) was organized, but like the earlier attempt by Spear and Van Horn it failed. Another six years passed before anyone dared to try again.

In August 1890 the Provo Woolen Mill's directors met the challenge successfully when they turned on electric power in the city for the first time. The Provo Daily Enquirer responded to the epic occasion by declaring that Provo was now one of the best lighted cities in the United States.⁵ Undoubtedly, the newspaper and the citizens of Provo had good reasons to be proud of their electric street lights because they had waited longer than the people of Salt Lake City, Ogden, and Logan had. Also, the city was the first in Utah County to be lighted with electric lights. However, the paper exaggerated because the city was not one of the best lighted cities in the United States.

⁵"The Electric Light," Provo Daily Enquirer, August 6, 1890.

Conditions of the day prevented the company from operating efficiently. Its incompetency became so pronounced that in April 1892 the city council cancelled the power company's street lighting contract and plunged the city into darkness.⁶ However, the company's contract was later renewed. In 1893 customers complained that the light rates were too expensive. Naturally, the city once again asserted that the company failed to honor its contract and threatened to discontinue lighting the streets with costly electric lamps. At that time the city council discussed the feasibility of a municipal plant like the one in Logan. The idea never materialized, and the city continued to complain about Provo Woolen Mill's service. Therefore, when the opportunity arose to sell the company, the Provo Woolen Mill's owners eagerly seized upon the offer and sold its plant in 1899 to Lucien L. Nunn.

As late as 1899, Lehi, Pleasant Grove, and American Fork were without electricity. Nonetheless, Provo lost her domination when Christian Garff of Logan met with officials from the three cities and asked for their cooperation in building a power plant. The officials responded favorably by organizing the Utah County Light and Power Company in September 1899, and without delay the company initiated construction on the required facilities. It erected power poles and lines through Highland, Lehi, American Fork, and Pleasant Grove and along various county roads. At the mouth of American Fork Canyon, it built an electric power plant, and in 1901 the power was turned on for the first time. Later, that same plant was enlarged

⁶"To the City Council," Provo Daily Enquirer, April 16, 1892.

in 1908, and an additional plant was built two miles up the canyon from the first one to help supply power for the Tintic mines and smelters. Besides the two plants in American Fork Canyon, it built one in Alpine that served Draper and Midvale.

As with other small power companies, the Utah County Light and Power Company had generating difficulties because its generators were unable to maintain the high voltage required. For example, the generator in the second American Fork Canyon plant burned out repeatedly because of the high voltage. Because of those setbacks, it consolidated with the Knight Power Company in 1912. Later in 1913 the Utah Power and Light Company bought the Knight properties to add to its already expansive system.⁷

In the meantime, the Jordan River Electric Generating Company was incorporated in 1894. Three years later it was reorganized and changed its name to the Salt Lake City Water and Electric Power Company.⁸ As early as 1894, the company attempted to start construction on its facilities, but it was not until 1897 that actual construction began. During those intervening years, the power company negotiated with the Utah and Salt Lake Canal Company which owned the rights to the Jordan River. Finally, in 1897 the power company signed a contract with the canal company which insured that it would receive sufficient water to run its hydroelectric plant. After the contract was signed, a power plant and dam were built, and power lines were

⁷Utah County Light and Power Company Historical File," Corporate History, Utah Power and Light Central Files.

⁸"Jordan River Electric Generating Company Historical File," Corporate History, Utah Power and Light Central Files.

stretched to Bingham and Mercur. Besides providing electricity the company reclaimed ten thousand acres of land in the southern portion of Salt Lake County.⁹

However, the company's history was short and filled with problems. For example, frequent power failures hampered mining operations in Mercur and Bingham. In addition, it suffered from water disputes, law suites, and dissension among its stockholders. Perhaps, the biggest issue involved the company's proposal to raise the level of Utah Lake by building a second dam. Farmers and property owners along the shores of the lake protested loudly by claiming that their property would be inundated. To appease their opponent's hostilities, the company promised that every possible precaution would be taken to protect their property. If it were necessary, the power company agreed to construct dikes along the lake. After overcoming these objections, the company finished its second dam in 1899. Because the equipment in the new plant was poorly installed, the potential of the plant was not realized. As a result, because of its mediocre product and ruinous competition from Lucien L. Nunn's plants in Logan and Provo which provided better service to Bingham and Mercur, the Jordan River company conveyed all of its property to Nunn in March 1907.

The Nunn years

In 1880 just four years after Colorado was admitted to the Union, Lucien L. Nunn appeared in Colorado's western mining districts near the Utah border. At first he tried to establish a law practice in

⁹Provo Daily Enquirer, August 5, 1897.

Telluride, Colorado, but the small mining town was not quite ready for the new lawyer. Several years of hardship passed before he built up a prosperous practice which gave him time to pursue other interests.

It was in the mining industry where his talent surfaced. With Judge William Story of Ouray, Colorado, Nunn explored and studied various methods to make Western Colorado's mines profitable again. They carefully investigated cable drive, compressed air, and electricity. It was the last source of power that attracted their attention and led Nunn to read more about George Westinghouse's work with alternating electric current. It aroused his interest so much that he undertook to familiarize himself with it and prove its reliability.

Consequently, Nunn built his famous Ames, Colorado, plant where he first worked with alternating current. Prominent engineers doubted that he could prove that alternating current was dependable. However, he demonstrated that it was when he began transmitting it from his Ames plant to nearby mines. His Ames plant was the first power station in the United States to transmit alternating current for power purposes.

His good fortune prompted him to search for new sites for alternating current plants. This led him to Utah and the Wasatch Front where he built a hydroelectric plant on the Provo River in Provo Canyon in 1897. For several years his canyon plant competed with the Provo Woolen Mills for Provo's market. Moreover, his plant established one important precedent in the United States. It was the first plant to transmit electric current over a long distance when he ran a 44,000-volt power line thirty-two miles to Mercur from his plant in Provo Canyon in 1898. When the line was completed,

that booming-gold mining town became the first completely electrically equipped mine and mill in the history of the industry. In addition, he built another line from his plant in Provo Canyon to Eureka, Utah.

Shortly thereafter, he joined with his business associates, William Story, George Wilson, and Oliver Dean, to form the Telluride Power Company of Colorado. Because of Nunn's preeminence in the electric power field, he was made trustee and general manager and given the authority to guide Telluride as he saw fit. Further, they established a branch in Utah for the purpose of electrifying Utah's mines with the electrification of nearby cities and towns incidental to bringing electricity to the mines.

Without delay Telluride under Nunn's expert guidance started to expand its operations. It began by connecting Nunn's Logan and Provo plants into one system by erecting power lines from his plants to Bingham in 1902. The next year Telluride bought the Logan Power Company from Story, Wilson, and Dean. During the same year it finished building the Olmstead Station in Provo Canyon to replace Nunn's original plant. Two years later it built the Battle Creek plant in Battle Creek Canyon in Utah County. While Telluride was building the Battle Creek plant, it also initiated construction on Grace Power Plant on the Bear River in Bannock County, Idaho. Work began in the fall of 1906 and finished in July 1908. When it was completed, the Grace Plant contained a 5500-kilowatt Westinghouse generator which made it the largest unit in the Telluride system.¹⁰ Eventually,

¹⁰"Report on the Grace Plant of Telluride Power Company," dated January 1, 1910, located in "Telluride Power Company Historical File: Number Three," Utah Power and Light Central Files.

a power line ran from the plant in Grace through Logan to Provo. Two years after the Grace plant was built, Telluride constructed another plant in Idaho at Oneida. During the next four years it bought the Jordan Harrows plant from Gunn, the Richfield plant at Glenwood, and the Sevier Light, Power and Milling Company and joined them to its main line running southward from Grace. In addition, it organized local companies to retail its power in Provo, Stureka, Silver City, Kamoth, Mercur, Milford, the Star Mining District, and Beaver City. Even though these retail companies were small, they were still progressive because they adopted the latest equipment and available methods of distribution like tungsten lamps and meter rates simultaneously with the larger companies in the United States.¹¹

Even though the construction and the purchase of the above plants represented a truly awesome growth, Telluride's grandest scheme was to convert the Bear Lake into a reservoir for its Grace plant. On May 26, 1902, Gunn first filed to appropriate the water from the lake.¹² Because of Gifford Pinchot's influence concerning conservation, Gunn's plans were temporarily thwarted. After five years of dealing with Gunn, the Federal government finally consented in 1907 to the project. The government stipulated that he must follow strict regulations to avoid polluting or wasting the waters of Bear Lake. Three years later the water from the lake began to turn the

¹¹Telluride Superintendents, Minutes of Meetings of Superintendents, December 31, 1909, and January 1, 1910, "Telluride Power Company Historical File: Number One."

¹²"Bear Lake and River: Water Supply and Use," located in "Telluride Power Company Historical: Number Three," Utah Power and Light Central Files.

dynamo at the Grace power plant.¹³ Thereafter, Bear Lake became one of the most scientifically controlled sources of power in the United States.

In this time of rapid expansion the Telluride company was hard pressed to staff its force with trained personnel. To meet this need they organized a school of electrical education. The first program to train novices began in Provo in 1903. Eventually, it enlarged to become an integral part of company operation, and schools were located in Grace and Logan. All of the students were employees on the lines and waterways, in garages, and in the experimental laboratories. They learned about electricity in theory and practice. In time the school came to be distinguished by the name of the Telluride Institute.¹⁴

As the first decade of the twentieth century closed, Nunn was seriously challenged for the leadership of the company for the first time. James Campbell, who owned one-third of the Telluride Power Company, sought control of it. Charging Nunn with misappropriation of \$250,000 from the company and the institute, he hoped that Nunn would be relieved as trustee and general manager. Much to his chagrin Nunn was not relieved but was found innocent of the malicious charges. Consequently, Nunn won the battle and retained control of the company.

¹³Clark Cheever, "The Telluride Power Company Physical Report," dated September 1, 1912, "Telluride Power Company Historical File: Number Three," Utah Power and Light Central Files.

¹⁴"Utah Power and Light," Electrical West, 129 (1962): 302.

Nonetheless, Mann decided to divest himself of his interests in the company. In August 1912 J. A. Nutt, Mann's friend, bought the controlling interests in Telluride and three months later with the board of directors permission sold all of Telluride's assets to the Utah Power and Light Company.

Davis County

While Mann and Telluride were expanding in Utah County, Cache County, and parts of Idaho, electric power companies were making their first appearances in Davis County. The first two power were the Davis County Light and Power Company and the Home Telephone and Electric Company which were incorporated in 1908 and 1909. Unlike their counterparts elsewhere in Utah, they cooperated, using the same power generating facilities and power lines.¹⁵ As a result, they were able to generate and to distribute electricity in Davis County as cheaply as Utah Light and Railway did in Ogden and Salt Lake City.

Because of their close cooperation, they expanded in the same general direction. By 1910 they were successfully competing against the Utah Light and Railway Company in Weber County providing Clearfield, Roy, Clinton, Cooper, Wilson, Harriett, Riverdale, West Point and Plain City with power. In Ogden, the Home Telephone and Electric Company failed in a bold attempt to acquire a franchise. But by serving towns elsewhere in the county it helped contain Utah Light and Railway to Ogden. However, the two Davis County companies

¹⁵Salt Lake Herald, March 2, 1913, p. 3.

did not let their Weber County interests obscure the fact that their primary goal was to provide Davis County with electricity. As a result, their lines stretched from Layton in the north to Bountiful in the south. In between they provided electricity in Farmington, Centerville, Syracuse, and Kaysville.¹⁶

In addition, the Farmington City Municipal Distribution System, the Bountiful Light and Power Company, and the Davis and Weber Canal Company provided electricity in various Davis County localities. However, they were not as successful as the Home Telephone and Electric Company or the Davis County Light and Power Company. For example, the Farmington company suffered from poor service and inadequate equipment and was forced to sell out to Utah Power and Light in 1916. The Bountiful company never did generate its own electricity but retailed electricity for Utah Light and Railway and later Utah Power and Light. The Davis and Weber Canal Company generated electricity for only a short time before Utah Power and Light bought it out to get control of its excellent hydroelectric plant on the Weber River near Riverdale, Utah.

Beyond the Wasatch Front

By 1900 most of the cities and towns along the Wasatch Front had electricity. Towns elsewhere in the state moved to provide themselves with electricity in the years after the turn of the century.

Characteristic were developments at Vernal in the Uintah Basin. Unsuccessful in attracting outside capital, local businessmen re-

¹⁶"Notes on Apparatus," dated July 1911, located in "Home Telephone and Electric Company Historical File," Utah Power and Light Central Files.

sponded to the continual pressure of the Vernal Express and formed the Vernal Milling and Light Company in 1907. This company proposed to engage in general milling and to supply excess power from their plant to the **City** of Vernal and County of Uintah.¹⁷ With a good show of local pride Uintah County citizens subscribed sufficient funds to make it a home electrical company in the main. The company purchased water rights along Ashley Creek approximately eleven miles from Vernal, obtained franchises, erected a power house, and built a dam at the mouth of the Vernal Gorge in 1907 and erected a power line to Vernal. Once that was accomplished, the city had the proud distinction of owning the only electric power plant within a one-hundred mile radius of Vernal. In February 1908 the power was turned on for the first time in residences and businesses.¹⁸ The people's reaction in Vernal was similar to that of others when they saw the electric light for the first time. They were enthralled and captivated by the glowing light. For some the light seemed God-sent. Further, they thought that it was the most important event in the history of Vernal.¹⁹

The history of Vernal Milling and Light Company was beset with difficulties. Because of the gypsum in the dirt canal walls, the walls were easily dissolved by the water; as a result, they frequently collapsed. The company tried to solve the problem by using gravel to line the canal, but this too proved unsuccessful. Until they used cement to fortify the walls, washouts along the canal con-

¹⁷"Vernal Milling and Light Company Historical File," Corporate History, Utah Power and Light Central Files.

¹⁸Vernal Express, December 9, 1908.

¹⁹"Let Us Celebrate the Event," Vernal Express, September 13, 1907.

tinued. Therefore, there was considerable inconvenience and loss of business. The severity of Uintah Basin winters also hampered service often reducing water supply to a minimum when the demands for electricity were at a maximum. Interestingly, another problem developed when patrons learned they could not exchange their old light globes for new ones. Some claimed that other power companies provided free globes and that the Vernal Milling and Light Company's lights were inferior.

Even with those complaints and problems, the demands for electricity exceeded the supply in the Vernal area. Therefore, the company enlarged its operations. When it bought new equipment, it sold its old machinery to Myton, Utah, forty miles southwest of Vernal. Thus, another town received electricity. When Utah Power and Light bought the Vernal company in 1926, it owned a 250-kilowatt General Electric generator, thirty-six miles of power lines, and incandescent lights.²⁰

The rest of the companies that were founded around the turn of the century in Utah were small and scattered throughout the state. For example, the Coalville City Municipal Plant, which was built in 1905, had only 5.95 miles of power lines in 1917 when Utah Power and Light took it over. The situation in Payson was quite similar because its early municipal plant and system were too small and inadequate. When the Strawberry project sponsored by the federal government was completed near Spanish Fork, it abandoned its plant and

²⁰W.L. Cone and Fred G. Wieden, "Report Upon Vernal Milling and Light Company," dated August 1925, located in "Vernal Milling and Light Company Historical File."

system for a much larger and better one. In addition, a small municipal plant was built in Manti. Similarly, there were small plants in St. George, Hurrincance, Parowan, Cedar City, Nephi, Fountain Green, Moroni, and Orangeville.

Small plants suffered from the same problems that plagued the larger ones, but because they were smaller their problems were compounded. Finance was extremely difficult to obtain. Outside capitalists rarely wanted to spend money in remote areas like Cedar City, Parowan, and Nephi, and local residents had little to invest. Without a large population and without industry, the possibilities for a return on the investment were drastically curtailed. Consequently, convincing outside investors to loan money for electric power plants was extremely hard. Furthermore, because the power facilities were more primitive than in larger cities, service was extremely erratic. Breakdowns, floods, electrical storms, and ice were the banes to the rural power companies. However discouraging the hardships were, those little electric companies struggled along and did much to improve the quality of life in their localities. Thus, in some ways their achievements were more notable than the ones in Ogden, Salt Lake City, Provo, and Logan.

For Cedar City the problems began when the owners of the power company tried to finance a powerhouse, a dam, and a canal. Estimates for the project ranged from \$23,000 for facilities on Mammoth Creek thirty-five miles from Cedar City to \$13,478 on Coal Creek a few miles east of Cedar City. The latter site was chosen, and a loan from the Bank of Southern Utah in Cedar City was negotiated.

Construction was launched in 1907. Difficulties first arose when the dynamo for the powerhouse arrived by train in Lund several miles from Cedar City. After struggling for quite sometime, Evan Williams and Neil Bladen finally managed to load the 10,000-pound generator onto their wagon. But the real struggle had just begun. Because the generator was so heavy and awkward it took three teams of horses resting every 3 hundred yards two days to transport it to Cedar City. When it finally did arrive at the powerhouse, Williams and Bladen discovered that the tremendous weight had broken the rear axle of their wagon beyond repair.

While the owners were struggling to build the powerhouse, a log dam and dirt canal were constructed to store and carry water. When the water was turned into the canal, it created problems because of the gypsum in the dirt. As a result, there were many washouts and landslides. The above difficulties became so serious and frequent that the owners decided to abandon the canal and to purchase the Cedar City Arid Farm Company's steam engine which was capable of pulling 20 plows.

However, the steam engine created as many problems as it solved. When the engine was brought into town, it was driven down a main street where it hit a wet spot in the road and sank down into the mud. It remained stuck for several weeks and almost tipped over. Finally, it was retrieved and set up at the powerhouse where it was necessary to knock out part of a wall in order to run a belt to the generator. In the spring of 1908, the canal was repaired. Thereafter, the steam engine was used only in emergencies.

By the time the entire project was completed the company's financial outlay had reached \$40,000. Unfortunately, power sales gave little promise of repaying the debt. Repairs and operating expenses further complicated the company's shoestring operation. The company hoped the city would assume the debt and operation of the plant. However, strong objections from city residents forced the city to reject the proposal, and the company owners were left to manage as best they could.

During the next several years the company had to cope with various problems. In the winter the water froze in the canal, and someone had to break the ice continually to maintain stream flow. Maintaining the dam was equally difficult. Lehi M. Jones, the son of a company officer, recounted that he and others chopped down every tree in the canyon repairing the log dam. However, the powerhouse proved to be the biggest burden. Someone had to be there whenever the generator was running because of the threat of electrical fires and breakdowns. On special nights when there was a dance or play everyone who knew how to run the plant had to be up at the plant to keep it running. As a result, they missed all of the cultural events in Cedar City. Even with the best effort of all parties involved the company's service was erratic and inadequate. Consequently, the company was sold to the Dixie Power Company in 1919.²¹

Ogden and Salt Lake City had indeed lost their unique status as the only cities in Utah with electricity. Their loss was Utah's

²¹York F. and Evelyn K. Jones, Lehi Willard Jones: 1854 - 1947, (Salt Lake City: Woodruff Printing Company, 1972), pp. 163-73.

gain as cities and towns throughout the state acquired electrical power. With the exception of Logan and Provo which had excellent generating and distributing facilities as result of Lucien L. Nunn's work, the small towns in Utah struggled against tremendous odds, but they overcame their problems and brought power into the remote and less populous areas.

CHAPTER IV
ELECTRICITY IN MINING

Introduction

Meantime electricity was adopted for use in the mines. This meant new developments in generation and transmission of power and the construction of steam plants in the locality of mines and smelters.

At first steam power was used to operate the machinery in the mining industry, but it was bulky, expensive, and dirty. Because many mines in Utah were located great distances from sufficient power sources, the precious fuels to run the steam equipment were hauled to the mines at tremendous costs. Consequently, many valuable ores were left undeveloped. Thus, a better power source was sought.

The perfection of long-distance power transmission broke through the barrier that prevented mining in many remote areas of Utah. Long-distance power transmission was made possible by the development of alternating current in the 1890s by George Westinghouse. Thereafter, power lines from distant power sources were able to be built across valleys and over mountains for many miles so that the heretofore neglected areas could be mined profitably.

As a result, the mining industry at the beginning of the Twentieth Century was one of the most important fields for the application of electricity. Electric machines were employed in all aspects of mining. In its early stages, electricity was used to illuminate the mines and offices. Shortly thereafter, electricity was adapted

for drilling, cutting, hoisting, pumping, and ventilating. Finally, electric traction was introduced.¹ Although as indicated the uses of electricity were diverse, the greatest proportion was devoted to pumping, hoisting, and ventilating.²

The development of power transmission required hard work and large amounts of money. In Utah several electric power companies participated in the application of electricity to mining between 1885 and 1912.

The power companies in the mining districts
of Park City and Tooele County

One of the first companies to bring electricity into the mining industry was the Ontario Silver Mining and Electric Company of Park City. As early as 1885 the company experimented with electric equipment to light their mines and offices. One year later they built a small hydroelectric plant which was equipped with a small direct-current General Electric generator and stretched a 2300-volt transmission line from their power plant to their mines and offices.³ By the end of 1886, electric lamps lighted the Crescent Concentrator at the Ontario Mine, Aschheim's store in Park City, the Ontario Hill, and Marsac Hill.

The monetary success of the Ontario Silver Mining and Electric Company prompted M.H. Quirk, W.B. Robson, J.M. Williams, F.M. Wil-

¹U.S., Department of Commerce and Labor, Bureau of the Census, Special Reports, Mines and Quarries: 1902, p. 145.

²"Electric Power in Mining," Engineering Magazine, 18 (October 1899 to March 1900): 765.

³"Ontario Silver Mining Company Historical File," Corporate History, Utah Power and Light Central Files, Salt Lake City, Utah.

liams, and other Park City businessmen to organize the Park City Light, Heat and Power Company on January 8, 1889.⁴ Because the company did not have a power plant, it bought electricity from the Ontario Silver Mining Company's plant and distributed it to the inhabitants of Park City and Summit County.

In 1895 the Ontario Silver Mining and Electric Company and the Park City Light, Heat and Power Company merged and expanded as the demands for their power grew. Together, they built a steam plant in 1897 to supplement their existing hydroelectric plant. This plant was enlarged in 1900.

However, not everything was rosy. Because their two power plants were incapable of meeting the increasing power demands, they were forced to purchase additional electricity from Jesse Knight's power plant on the Snake Creek near Park City. After their steam plant burned down in 1909, even with Knight's assistance, they were unable to satisfy the needs of their customers. They consequently conveyed all of their property and franchises to the Utah Power and Light Company in December 1912.

Meanwhile, farther west in Tooele County, Utah, the electric power industry made itself felt for the first time when the Ophir Hill Mining and Electric Company was established in March 1900 by W.A. Clark, Charles W. Clark, A.H. Wethey, E.W. Clark, and others.⁵ In 1903 the company built a power plant near the town of Ophir.

⁴"Park City Light, Heat and Power Company Historical File," Corporate History, Utah Power and Light Central Files.

⁵"Ophir Hill Mining Company Historical File," Corporate History, Utah Power and Light Central Files.

Interestingly, the Ophir Hill plant never did supply power for mining but only for street and domestic lighting.⁶

At the same time the Ophir Hill Mining and Electric Company was struggling to survive, a sister company, the Clark Electric Power Company, was organized by E.W. Clark, E.M. Clark, W.J. Barrett, E.B. Critchlow, and Frank Pierce. It built a 250-kilowatt hydroelectric plant in 1905 near the town of Tooele and ran power lines to the mining towns of Stockton and Grantsville.⁷

Because of their close proximity, the Ophir and Clark companies cooperated. Together, they built the South Willow hydroelectric power plant in 1912 and 1913, which was considered to be one of the West's largest and most complete hydroelectric plants. They also erected the South Willow-Stockton power line that connected their two systems. When that line was completed, their jointly-operated network consisted of 51 miles of power lines and three power plants that served Tooele, Grantsville, Stockton, and the Ophir Hill Mine. As a result of that informal union, they increased their efficiency of producing and distributing electricity.

In the 1920's they were forced to sell their plant because they were unable to meet the demands of their customers. On December 17, 1924, they conveyed the deeds for their property and franchises to Frank A. Reed. Two years later, he sold the Clark Electric Power Company to the Utah Power and Light Company. However, he kept the

⁶Orin Ashton, former employee of the Ophir Hill Mining Company, interview, September 14, 1939, "Ophir Hill Mining Company Historical File."

⁷"Clark Electric Power Company Historical File," Corporate History, Utah Power and Light Central Files.

Ophir Hill Mining and Electric Company until November 1929 when he also sold it to the Utah Power and Light Company.

Telluride's retail agents
in the mining districts

During that same time that the mines in Tooele County were being electrified, the Telluride Power Company under Lucien L. Nunn's guidance was establishing retail agents in the various important mining districts of Utah adding to the monumental 44,000-volt power line running from Provo to Mercur that initiated long-distance power transmission in the United States. By distributing power through local subsidiaries, the Eureka Electric Company, West Mountain Electric Company, the Institute Electric Company, and the Camp Floyd Electric Company, Telluride was able to influence the mining industry in Utah as it did the mining industry in Colorado.

The first company to be incorporated was the Eureka Electric Light Company (the predecessor of the Eureka Electric Company). On March 1, 1895, George Adams, L.J. Blue, the Tintic Merchantile Company, V.L. Thomas, Will Adams, and others organized the Eureka Electric Light Company. The company owned a small steam plant which furnished electricity for street lighting and for commercial and residential lighting in Eureka. In 1901 it began serving Juab County when officials granted it a franchise to supply the county with electricity. The small company sold electricity in Eureka and Juab until 1903 when it was bought by the Telluride Power Company.

After buying the Eureka Electric Light Company, the Telluride Power Company reorganized it by changing its name to the Eureka Electric Company. Furthermore, the Eureka Electric Company dis-

tributed electricity for Telluride in Eureka, Silver City, and Mammoth. For nine years that small electric company operated as a retail agent for Telluride until the Utah Power Company purchased it in 1912.

Another company which operated as retail agent for Telluride was the West Mountain Electric Company of Bingham. It was first organized in 1901 by Albert L. Woodhouse, Florence P. Woodhouse, and Edgar C. Lackner after they were granted a franchise in the West Mountain Mining District in Salt Lake County. The first years for the company were difficult. After the initial euphoria of electrification of the Old Commercial Mine, the Dalton Mine, and the Boston Consolidated Mines, the West Mountain Electric Company suffered from that haunting nemesis, frequent power failures and shutdowns. The Jordan River Electric Generating Company which supplied it with electricity was unable to furnish the constant electric current necessary to run saw mills, electric air compressors, and other electric mining equipment.⁸ If the mine owners and operators in the district were to be convinced that electricity was a cheap and reliable source of energy, the West Mountain and the Jordan River electric companies were not appropriate emissaries.

However, the company's sorry performance was altered. In April 1906 Lucien L. Nunn bought the West Mountain Electric Company. By connecting his power lines from Logan and Provo with West Mountain's lines, he furnished cheap and reliable electric power. In doing that, he negated the worries about future power failures. If one

⁸"West Mountain Power and Light Company," Utah Power and Light Synchronizer, November 1923, Utah Power and Light Central Files, pp. 3-4.

of his plants was shut down, he could use power from the other one. Also, he built additional plants at Battle Creek Canyon and Grace, Idaho, to increase the power available for the mines. As a result, reliable and efficient electric power served Bingham.

In April 1906 Nunn sold his property to the Institute Electric Company that had been organized during April by William L. Biersach, Edgar Lachner, and Neil A. McKay. The company never did generate any electricity because it distributed for the Telluride Power Company over twelve miles of power lines. Unlike its predecessor, the West Mountain Electric Company, the Institute Electric Company had the benefit from the beginning of having the support of the entire Telluride System, which was quite extensive at the time. Consequently, dependable service was provided by the Institute Electric Company until the Utah Power Company bought its distribution lines in 1912.⁹

Telluride's fourth retail agent in the mining districts was the Camp Floyd Electric Company at Mercur. It was incorporated in 1901 by Albert L. Woodhouse. Like the other three retailers, it only distributed power. Besides furnishing Mercur, one of the richest mining towns in Utah, it stretched lines to Cedar Fort, Fairfield, and Manning.¹⁰ Shortly after the construction of the power line to the forementioned towns, it sold its property to the Utah Power Company in 1912 which in turn sold the property to Utah Power and Light later in 1912.¹¹

⁹"The Institute Electric Company Historical File," Corporate History, Utah Power and Light Central Files.

¹⁰"Electric Company for Farm District," Provo Post, May 7, 1912.

¹¹"Camp Floyd Electric Company Historical File," Corporate History, Utah Power and Light Central Files.

"Uncle Jesse"

An important figure in Utah's mining industry was Jesse Knight who was affectionately called "Uncle Jesse" by his friends. Jesse found Humbug properties in the Tintic Mining District by himself, but he called it a manifestation from God. Because of that windfall, he bought more claims in the Tintic District and became progressively richer. By the time he was finished buying claims in the area, he was worth ten million dollars.

At the center of his operations, he built Knightsville. The town was an anomaly because it lacked the usual saloons and pool halls where the miners could spend their hard-earned money. Rather, he built a basketball court, a warehouse (a Mormon church), and an amusement hall where he sponsored concerts, town dances, and socials.¹²

With his accumulated wealth he expanded his enterprises among other things by building electric power plants. In the first decade of the Twentieth Century, he laid the initial groundwork for a new company when he proposed to organize an investment company to finance his Utah mining and smelting concerns. In September 1906 Jesse Knight, his wife, Amanda Knight, Iona Knight, Inez Knight, and Jacob Evans incorporated the Knight Investment Company to develop Jesse's forty-five mining claims of which thirty-two were in the Tintic Mining District, one was in the Park City Mining District, and eleven were in Uintah County Mining District.¹³ Shortly after incorporation

¹²Wallace Stegner, Mormon Country, (New York: Duell, Sloan, and Pierce, 1942), pp. 199-208.

¹³"Knight Investment Company Historical File," Corporate History, Utah Power and Light Central Files.

the company built a smelter at Silver City in the Tintic Mining District. Because Knight did not own an electric power plant yet, he was forced to purchase electric power from the Utah County Light and Power Company and the Telluride Power Company to run his smelter. For a short time both power companies furnished the Knight mines and smelter with power.

However, he knew that he needed additional power to run his smelter. To meet this need he decided to back James Murdock's electric power company which was building a hydroelectric plant on the Snake Creek near Park City. When the panic of 1907 struck, Murdock discontinued work. Whereupon the ambitious Jesse Knight took on the entire project. Before 1907 was over he acquired all of the water rights along the Snake Creek from the Wasatch Development Company. In January 1909 he merged with Joseph R. Murdock, R.E. Allen, Moroni Smith, and Wilford Van Wagenen to incorporate the Snake Creek Power Company to supply the principle mines at Park City with electricity. Although the Knight Investment Company under Jesse financed the Snake Creek Power Company, day-to-day operations were left to local interests in Park City. When it became apparent that the 1180-kilowatt Westinghouse generator in the Snake Creek power plant did not furnish sufficient power for Knight's mining interest, he built another plant on the Provo River in 1910, which he christened the Murdock Plant. In that plant he installed a 2500-kilowatt General Electric generator.¹⁴ Together, the Snake

¹⁴"Report Covering Completed and Proposed Developments and Other Holdings of the Knight Power Company," Unpublished Report, dated August 1, 1911, "Knight Power Company Historical File," Utah Power and Light Central Files, pp. 4-5 and 22.

Creek plant and the Murdock plant adequately filled the requirements of Park City and Knight's mining concerns. Meanwhile, he recognized that the Tintic Mining District operations could use more power. After the Knight Investment Company acquired the water rights in the Santaquin Canyon in 1908, it built a hydroelectric plant in the canyon, and ran a power line to the Tintic Mining District. Nevertheless, it was still necessary to purchase electricity for his Tintic mines from the Utah County Light and Power Company and the Telluride Power Company.

As early as 1909, Jesse Knight had contemplated expanding his operations by connecting his three plants. To this end he, with R.E. Allen, J. William Knight, W.L. Mangum, Moroni A. Smith and others incorporated the Knight Power Company. In addition to joining his plants, he bought the Mill Creek Power Company, a small electric company near Salt Lake City in 1906.¹⁵ Thus by 1910 the Knight Power Company owned a total of five plants, one in Santaquin, one on the Snake Creek, one in Provo Canyon and two in Mill Creek Canyon. Further, it owned power lines in Utah County, Summit County, Wasatch County, and Salt Lake County. It supplied power in the Tintic and Park City mining districts, in Utah County, and in Salt Lake County.¹⁶ By 1912 Knight was competing successfully with the Telluride Power Company. Indeed, the Knight Power Company became Telluride's biggest rival in the mining districts that

¹⁵Ibid., pp. 2-5.

¹⁶A.P. Merrill, "Report Covering Completed and Proposed Power Developments and Other Holdings of the Knight Power Company," Unpublished Report, dated August 1, 1911, Utah Power and Light Central Files.

used electricity. In addition, the Knight Power Company obtained franchises in Lehi, Pleasant Grove, and American Fork because the Utah County Light and Power Company's service was inconsistent and inadequate. However, to obtain franchises in those towns, Jesse was obliged to merge with the Utah County Light and Power Company.

That big consolidation occurred on January 30, 1912, when Jesse Knight, Stephen L. Chipman, John P. Cahoon, M.M. Miller, R.E. Allen, and others incorporated the Knight Consolidated Power Company.¹⁷

The new company owned eight power plants which made it the third largest electric power company in Utah behind the Telluride Power Company and the Utah Light and Railway Company. Moreover, it had the proud distinction of being the second largest builder of power transmission lines in the state after it finished erecting a 44,000-volt line that connected all of its plants and served the Midvale smelting industry and mining and smelting operations in Eureka.¹⁸

The Knight Consolidated Power Company's life was short. On October 9, 1912, the Utah Power Company bought it. Later in October, the Utah Power and Light Company purchased the Knight property from the Utah Power Company. Thus, it united the property with that company's growing system.

Services of electricity

After Lucien L. Nunn proved that long-distance power transmission was practical, electricity revolutionized mining. Thereafter plants

¹⁷"The Knight Consolidated Power Company Historical File," Corporate History, Utah Power and Light Central Files.

¹⁸"Utah Power and Light, Electrical West, 129 (1962): 306.

were built where the resources could be the most easily exploited. Immediately, Jesse Knight and the Telluride Power Company took advantage of those advances in long-distance power transmission by running lines westward from their plants built along the foothills of the Wasatch Mountains to the mine fields of Tintic and Bingham. Thus, inexpensive electricity was brought to the mines in Utah.

Electricity had several advantages over steam. First it was cleaner because it did not produce any smoke, gaseous odors, or dust like the steam engines did. It abolished space-wasting fuel bins, boilers, and pipes. Also there was no leakage of power when the electricity was not being used. That was a definite contrast to steam because leakage of power was a constant problem. Then too the heat from the steam pipes was objectionable. Moreover, small wires replaced the bulky and cumbersome pipes used to distribute steam or compressed air to run the hand drills, and other hand tools. Perhaps, the greatest asset was its labor saving capabilities because less energy was expended to run the equipment.¹⁹ Therefore, it was fairly easy for the electric power companies to take over functions previously provided by steam and compressed air.

In Utah one of the first uses for electricity in the mines was the lighting tunnels and office buildings. The first company to use electrical illumination in the mines was the Ontario Silver Mining and Electric Company of Park City when it lighted its works with electricity for the first time in 1886. Later, the Jordan

¹⁹W.H. Kritzer, "Electric Power in Mining," Salt Lake Mining Review, 5 (October 15, 1903): 18.

River Electric Generating Company sold its electricity for lighting in the mining towns of Mercur and Bingham. Nunn also supplied electricity for lights in Mercur at the Golden Gat, Chloride Point, Overland, Sacramento Mine, and the Mercur Mine from his hydroelectric plant in Provo Canyon.²⁰ Further, his power lines from Logan and Provo were connected in Bingham. Soon other companies like the West Mountain Electric Company, the Institute Electric Company, the Beaver Power Company, and the Jesse Knight companies were furnishing electricity for illumination in the mines.

Arc and incandescent lamps lighted the mines, and both had their advantages and disadvantages. Inside the mines incandescent lights were preferred for several reasons. First, the subterranean spaces were restricted in area; therefore, it was only natural that the small incandescent lights were more desirable. Also, miners objected to the arc light's open flame which could easily cause a fire. Third, the incandescent system was more flexible because it could be readily moved from one part of the mine to another. Last, the incandescent light was cheaper and more reliable. Because arc lights were brighter and lighted a larger area, they were used extensively to illuminate the exteriors of buildings and their surrounding yards.²¹

In addition, electric hoists replaced the steam hoists. Because it was compact, economical, easy to operate, and more powerful, it solved the problem of hoisting ore from deep shafts. For example,

²⁰Salt Lake Mining Review, 1 (April 15, 1899): 8.

²¹Mines and Quarries: 1902, pp. 157-58.

electric hoists were utilized at the Free Silver Mine in Aspen, Colorado, and the Comstock Mine in Virginia City, Nevada.²² In Utah one of the first electric hoists was installed at the mines in Mercur in 1900 by the Jordan River Electric Generating Company. Later, Jesse Knight and the Telluride Power Company installed electric hoists in their mines in Tintic. By 1902 twelve electric hoists were used in Utah's mines.²³

Closely related to electric hoists was electric traction that replaced the slow and expensive mule- or horse-drawn ore cars in the mine and steam engines outside. Throughout the United States electric locomotives hauled ore from the mines to the smelters which was a striking application of electricity to mining. Besides using electric power to haul the excavated ore from the mines to the mills and smelter, it was used to run small electric locomotives inside the mines where they pulled the ore cars from the various working areas to the surface.

The locomotives ranged in size according to the work they performed and generated considerable savings for the mine owners and operators. They were as small as two tons and were as large as twenty tons. Generally, the larger ones were used in coal mining while the smaller ones were used in the metalliferous mines. The advantages of electric traction over the previously used horsepower or mulepower were tremendous. The cost of haulage was less with electric locomotives. As a result, overall mining expenses were

²²Ibid., p. 156

²³Ibid., p. 528.

reduced.²⁴ Because they produced considerable savings in coal mines, electric locomotives were introduced in the metalliferous mines like gold and copper mines in Utah where the Highland Boy Gold Mine and the copper mines in Bingham used them.

Even with the advanced state of electric haulage, it still did not completely eliminate other means of transporting the ore. Sometimes compressed air haulage, mules or horses, and ropes were better than electric means. Compressed air was ideal where the electric sparks from faulty electric locomotives could cause fires. As a result, compressed air was still prevalent in coal mines where gas was frequently found. On steep grades ropes were better than electric methods because the electric motors often burned out on such steep inclines. Further, there was still doubt in the early 1900s as to electric traction's reliability.²⁵

Another beneficial service of electricity was ventilating the mines with fans and blowers. Mercur, which was totally electrified by 1900, used electric fans and blowers to provide fresh air in the tunnels. Ventilation was particularly important in coal mines where poisonous gases accumulated and threatened the lives of the miners. Generally, a small fan was placed at the mouth of the mine to force fresh air into the mine. As a result, fresh air replaced the stale and rancid air already present in the tunnels.

Before long the uses for electricity in mining were many and varied. Electric motors were extremely useful in driving pumps to

²⁴Frank C. Perkins, "The Electric Locomotive in Mine Operations," Salt Lake Mining Review, 9 (April 15, 1907): pp. 19-20.

²⁵Ibid.

remove water from the mines. Another use of electricity in the mines in Utah was the operation of air compressors which ran small tools, coal cutters, and drills. By using electricity, air compressors were able to be placed conveniently near the point near the application of air rather than outside the mine so the long and complicated systems of piping with the consequent loss of pressure, whether steam or air, were avoided.²⁶ In addition, electricity ran the rollers and crushers in the smelters and mills in Midvale, Tintic, and other mining districts throughout the state.

Thus, invasion of electricity into the mining industry of Utah at the beginning of the twentieth century was welcomed. Electric lights illuminated the tunnels more safely than kerosene or tallow candles did. Although the reliability of electric machinery at first was doubted and the mine owners and operators were skeptical of electric tools, the improvements of electric hoists, locomotives, and small hand tools decidedly confirmed that electric machinery was more efficient because they increased the speed and ease of transporting, digging, smelting, and milling the crude ore. Further, electric drills, cutters, and small hand tools increased the production of the mines while at the same time they decreased costs. Perhaps, the greatest contribution that electricity made to mining was the opening of remote and valuable districts with the advent of long-distance power transmission that opened mines which before electricity laid dormant because of the prohibitive costs involved.

²⁶Mines and Quarries: 1902, pp. 156 and 160.

However, without the pioneering, daring, and resourceful electric power companies that were led by the incomparable Lucien L. Nunn and Jesse Knight the electrification of the mining industry in Utah would not have occurred as soon as it did otherwise. Both men and their companies were truly heroic because they blazed the trail and proved that electricity was an untapped resource in the mining fields. Furthermore, they proved that electricity was valuable for other purposes than lighting as they introduced electric machinery into Utah. They not only recognized the great profits that they would reap from electricity in the mining industry were invaluable to Utah's future economic growth and development.

CHAPTER V

ELECTRIC RAILWAYS OF UTAH: 1889 to 1915

Introduction

During the decades between 1889 and 1915, electricity was put to an additional use when streetcars and interurbans were electrified. Like electric lighting electric transportation was glamorous and intriguing and after its introduction in Salt Lake City's streetcar system in 1889 it was a continuing reminder to the people of the city and the state that they were progressive and very much part of the industrial revolution. Streetcar lines were the first to emerge. They fought with each other, expanded their operations, and after bitter battles finally merged. Because they were successful, efforts were made to connect the major cities of the state with interurban lines. As a result, the distance between cities shrank and commerce increased rapidly.

Salt Lake City lines

Seventeen years before the advent of an electric streetcar in Utah, Salt Lake City was given the benefits of an animal-powered system when the Salt Lake City Railroad Company was incorporated in 1872.¹ Its first line began at the junction of Third West Street and South Temple Street and traveled eastward on South Temple Street to West Temple Street where it turned southward on West Temple

¹"Salt Lake City Railroad Historical File," Corporate History, Utah Power and Light Central Files, Salt Lake City, Utah.

Street to First South Street. The line then turned eastward and ran southward on Main Street to Third South Street where it terminated. Ten years after incorporation the company's mule-drawn streetcars ran on eight miles of track throughout the main section of the growing Mormon community. By 1889 the company had expanded until it owned 14 miles of track and 21 cars.

However, due to pressures from the proponents of the electric streetcars especially after Richmond, Virginia, had successfully initiated the country's first electric system in 1888, the Salt Lake City Railroad Company began replacing its mule-drawn cars with a system of rapid electric streetcars. After completing a steam powerhouse and erecting trolley lines, the company demonstrated its electric railway for the first time on August 3, 1889.² A newspaper account said that people along the line stared as though an apparition were flying by when they saw an electric streetcar running along a Salt Lake City street for the first time. As a result, Salt Lake City became one of the first cities west of the Mississippi River to have an electric streetcar system. By mid-1891 the electric streetcar was traversing the principle streets of the city. To this Alfred W. McCune, a local resident, said boastfully that the Salt Lake City Railroad was a model railroad and was ahead of others in the nation.

Riding one of the first electric streetcars was challenging and hazardous. At first the cars were open and without heating. Thus, frostbite and chill blains were common in winter. To dampen the

²Salt Lake Tribune, August 9, 1889, p. 4.

cold, straw was spread in the car. When a passenger disembarked from a car in the winter, it appeared that he had played in the straw or had visited the Ogden stockyards. Indeed, passengers long accustomed to ice-cold cars were astonished when a car with a stove stopped at Forest Dale in Salt Lake City one cold January morning to pick them up in 1892.³

But those problems did not deter the Salt Lake City Railroad. In 1891 it began making extensive alterations to its repair shops and powerhouse. Overhead trolley wires were divided into six districts to facilitate distribution of electricity. Garland stoves for heating purposes in cold months were installed in the street-cars and electric headlights were also used for the first time. Furthermore, the line was extended to Beck's Hot Spring (also known as Beck's Warm Springs), Fort Douglas, City Creek Canyon, and the principle cemeteries in the city. In addition, it operated a steam line to Garfield Beach on the Great Salt Lake. Its longest line ran six miles north and south through the city and by 1893 it had forty-two miles of trackage. The company had spent approximately \$100,000; giving it the best line in the city.⁴

Because the Salt Lake City Railroad's expansion continued at such a rapid pace for the next several years, its powerhouse's generating capacity soon became inadequate. To solve the problem it negotiated a contract with the Utah Power Company to furnish

³C.W. McCulloch, "The Passing of the Streetcar," Utah Historical Quarterly, 24 (1956): 124.

⁴"Salt Lake City," Street Railway Journal, 9 (April 1893): 239-40, (Xerox copy, Utah State Historical Society, Salt Lake City, Utah) and Salt Lake Tribune, January 1, 1894, p. 13.

electricity. This arrangement apparently left much to be desired because two years later the railway company broke the contract because the power company's electricity was too expensive, unreliable, and insufficient. After overhauling its old steam powerhouse the railway company reverted to generating its own power in 1899 producing its own electricity until it merged with the Salt Lake Rapid Transit Company in 1901 to form the Consolidated Railroad and Power Company.

Although the Salt Lake City Railroad's system was the largest and the best in the city, it faced aggressive competition from the Salt Lake Rapid Transit Company. Indeed, the competition became so heated that the companies sometimes tore up each other's tracks. The biggest complaint during these struggles was that the Salt Lake City Railroad Company invaded Salt Lake Rapid Transit territory when it built outside of the Salt Lake City limits. The battle even entered the courts where the two companies sued each other endeavoring to recover the money that they lost when their property was destroyed by the other.

The Salt Lake Rapid Transit was not easily intimidated. It not only fought tenaciously but grew stronger during the years from 1890 to 1901. Rapid Transit's vigor became increasingly apparent when it acquired two small companies in 1891 and 1893.⁵ In February 1891 it bought the East Bench Street Railway Company which had constructed an electric railway from Liberty Park to the state penitentiary south of the city. However, the Salt Lake Rapid Transit bought the

⁵Salt Lake Herald, May 1, 1895, p. 8.

line before the East Bench had the opportunity to begin operations. The second, the Popperton Place and Fort Douglas Rapid Transit Company, was established for the purpose of constructing and maintaining an electric railway from First Avenue through Popperton Place to the Fort Douglas Military Reservation.⁶ Even though the Salt Lake Rapid Transit acquired control of the company in 1893, the Popperton Place and Fort Douglas Rapid Transit maintained its corporate identity until 1901 when it too was absorbed by the Consolidated Railroad and Power Company.

Besides buying smaller streetcar companies, the Salt Lake Rapid Transit expanded its original holdings. By 1893 it owned 32 miles of track of which 10 miles were outside the city. Its longest line extended eight miles south to Murray. Thirty-three cars were powered by Edison, Westinghouse, and Thomson-Houston electric motors and eight were motorless trailer cars. Detroit stoves were installed in the cars for heat during the cold months. Unlike the Salt Lake City Railroad Company, the Salt Lake Rapid Transit Company produced its own power.⁷

By 1901 the battle between the two railways were taking its toll. Both companies foresaw bankruptcy and failure if competition continued. In addition, they realized that they would be unable to afford the latest equipment if their energies and time were spent

⁶"Popperton Place and Fort Douglas Railway Historical File," Corporate History, Utah Power and Light Central Files.

⁷"Salt Lake City," pp. 242-43 and Salt Lake Tribune, September 6, 1899, p. 12.

repairing the damages inflicted by their opponent. Thus, in 1901 they merged forming the Consolidated Railroad and Power Company.

Immediately, the new company launched a program of expansion. It extended its Murray line an additional 15 miles south to Sandy and built a line to North Salt Lake. In addition, it constructed a new car barn on the site of the old Salt Lake Rapid Transit barn which had burned down several years before. Rather than generating its own electricity, it arranged to purchase power from Utah Light and Power Company.

Even with those improvements, it faced considerable hostility from residents and city officials in Salt Lake City and its suburbs. Citizens opposed extension of its lines into their neighborhoods. Residents along Brigham Street in Salt Lake City wanted the streetcar tracks to be removed. They felt that tracks were ugly and distracted from the beauty of their street.⁸ In this they were right. The tracks and overhead trolley wires were grotesque especially at interchanges. In North Salt Lake mass meetings of citizens strongly protested the extension of any streetcar lines into their suburb objecting to trolley wires and tracks. In addition, the Salt Lake City attorney harassed the company by attempting to pass an ordinance forcing it to keep its cars clean. The company had up to that time refused to clean its cars resulting in a buildup of filth that had become hazardous. These problems created a burden that it was unable to solve. Consequently, it merged with the Utah Light and Power Company to form the Utah Light and Railway Company.

⁸Salt Lake Tribune, May 9, 1903, p. 2.

But the resources of the new company were also inadequate, and outside finance was obtained when Edward H. Harriman, the Union Pacific magnate, bought the controlling interests in the company. With his backing the Utah Light and Railway was able to modernize its system. One of the first things that it did was to extend its trackage. In 1909 the company had one hundred miles of track in Salt Lake County most of which was in the city. Two years later, there was 112 miles of track with the longest line extending to Sandy. The new rails that were laid were not only heavier but also stronger in order to hold the new streetcars which were equipped with forty-horsepower engines, airbrakes, and fenders. The company owned 144 cars which were inspected every night and were given a general inspection every five days.⁹ They were housed in a new car barn that was built at Fifth South and Sixth East Street in Salt Lake City. In the residential districts, new overhead trolley wires were erected on steel poles. Furthermore, they received power from four hydroelectric plants and one steam plant. To meet additional power requirements, it purchased electricity from the Telluride Power Company and the Utah Sugar Company.¹⁰

In 1914 just three years after those improvements were completed, the Utah Light and Railway Company sold its streetcar lines to the Utah Light and Traction Company. The Utah Light and Traction Company maintained the lines, but it replaced the trolley cars with

⁹Salt Lake Tribune, January 3, 1909, p. 77.

¹⁰"Electric Railways of Utah," Electric Railway Journal, 34 (October 2, 1909): 518-21, (Xerox copy, Utah State Historical Society).

new motor buses in the Twenties. Utah Light and Traction managed the system until it sold out in the 1930s.

As powerful as the forementioned companies were, they were unable to prevent smaller lines from competing. The first and most significant was the West Side Rapid Transit. During the 1890's it operated a line in the "Garden City," said to have been a preferred residential district on the west side of Salt Lake City. After changing its name to the Salt Lake and Utah Valley Railroad (also known as the Utah and Salt Lake Valley Railroad) in 1902, it extended a line from Redwood Road through Taylorsville, Bingham Junction, and West Jordan where it terminated.¹¹ In 1902 the West Side Rapid Transit was joined by the Salt Lake Suburban Railway. The suburban company built lines throughout the Salt Lake City area and even proposed to extend them into the county. However, it failed to build lines into the county because the Consolidated Railroad and Power Company exerted too much pressure on the county commissioners who blocked the suburban company's plans. Thus, neither of the small companies was successful in breaking the larger company's control of the streetcar business in Salt Lake City. By 1907 the Salt Lake Suburban Railway Company was forced to cease operations leaving the West Side Rapid Transit Company and the Utah Light and Railway Company as the only streetcar lines serving Salt Lake City. The Utah Light and Railway's business so

¹¹"Third Suburban Line," Salt Lake Tribune, August 5, 1902, p. 5.

completely dwarfed the West Side Rapid Transit as to give it a virtual monopoly of Salt Lake City transportation.¹²

In 1908 the West Side Rapid Transit and the Utah Light and Railway were joined by a new company when the Mormon church built the Emigration Canyon Railroad from Emigration Canyon to Salt Lake City. Combining a substantial freight business in building stone with sightseeing and recreation passengers it did a good business. Beginning at Fifth South Street and University Avenue its line ended at the Pinecrest Lodge which it built in the Wasatch Mountains east of the city. Nineteen stations dotted its tortuous line. Business proved to be so brisk that new cars were added to accommodate the pleasure seekers. Unlike the Utah Light and Railway and the other companies, the company did not identify its cars with mundane markings like numbers. Instead it chose romantic and descriptive names like the Washakie, the Tintic, the Oquirre, the Wanship, the Red Butte, the Uintah, and the Pioneer, which added charm to the already scenic line.

However, the line was plagued by operational problems. In winter months deep snow buried the tracks and forced the company to discontinue service frequently. With the advent of concrete as a building material, it was no longer necessary and profitable to transport large rocks from the canyon. Consequently, its once prosperous freight business dwindled to almost nothing forcing the company to depend increasingly on its passenger business. But the seasonal nature of sightseeing did not produce sufficient profit to

¹²U.S., Department of Commerce and Labor, Bureau of the Census, Special Reports, Street and Electric Railways: 1907, pp. 352 and 514.

remain in business. Another reason for the company's demise was its failure to secure working agreements with Utah Light and Traction, the Salt Lake and Utah Railway, and the Salt Lake and Ogden Railway when the opportunity arose in 1914. That blunder kept it from connecting its lines with companies that were operating in the black. Consequently, without a freight trade, without contracts with competing companies, and with a declining tourist business, the Emigration Canyon Railroad Company was forced to close. In 1916 it was completely dismantled, and its tracks and cars were sold to the Tacoma Municipal Railway.¹³

The Eccles lines

Farther north in Ogden similiar events were transpiring in the 1890's and the early 1900's. Like their neighbors in Salt Lake City, Ogdenites saw the glamor of the electric streetcar. Four years after the Salt Lake City Railroad electrified its lines, the Ogden Electric Railway Company innaugurated electric trolley service in that bustling Northern Utah community.

Ogden's first streetcar company's lines and business were meager. During its first years, it operated 20 cars over 10 miles of tracks with its main line extending five miles along Washington Avenue (now Boulevard).¹⁴ Without sufficient capital to maintain a high quality service, its business deteriorated rapidly. By 1900 only two cars were fit for passenger service. One ran

¹³Ira L. Swett, Interurbans of Utah, Interurbans Special 55, (1974), pp. 4-5.

¹⁴"Ogden, Utah," Street Railway Journal, 9 (April 1893): 244-45, (Xerox copy, Utah State Historical Society).

along Washington Avenue, and the other on Twenty-Fifth Street. However, bad as things appeared for Ogden's public transportation system, there was still hope.

The savior of the city's streetcar line was her famous son, David Eccles. In early May 1900 his company, the Ogden Rapid Transit, bought the properties of the ailing Ogden Electric Railway Company. In true Eccles fashion the line was transformed from a modest operation into one that eventually served most of Northern Utah.¹⁵ The Ogden Rapid Transit put the old lines of the Ogden Electric Railway back into operation. Along the main line on Washington Avenue, it built branch lines on every other street and in 1909 had six routes running throughout the city. Five years later it had constructed three more.¹⁶

The company's business was an interesting combination of freight and passenger trade. Because it served the rich fruit and vegetable areas in Weber County its freight business was very profitable. As important as the freight business was, the passenger lines were just as vital. The most fascinating line ran up the Ogden Canyon, which was pictureques, rugged, filled with resorts like the Oaks, the Idlewild, and the famous Hermitage, and dotted with camping spots and summer homes. The line began at the Union Depot in downtown Ogden and connected the small towns of Liberty, Eden, and Huntsville in the Ogden Valley with Ogden as early as 1915. Because of its scenic beauty, the Ogden Canyon line was extremely popular on

¹⁵Swett, p. 70.

¹⁶Ibid.

Sundays when tourists rode the streetcar up the cool canyon. July and August were the best months as thousands of tourists rode the trolleys up the canyon to the peaceful valley with its flowing artesian wells. The line remained a popular attraction until 1932 when a paved road was completed in the canyon to those idyllic places.¹⁷

The Ogden Rapid Transit's lines were extensive; as a result, it had a large rolling stock and power system. It owned thirty-seven streetcars which reached a maximum speed of thirty-eight miles per hour. Some even had modern conveniences like toilets. Further, it generated its own power from a steam powerhouse in Ogden on Washington Avenue between Nineteenth Street and Twentieth Street, but it suffered from obsolescence. As a result, the company constructed a hydroelectric plant near Willard which provided power for the railway and for lighting in Willard. However, that small plant was continually plagued with problems. In winter, ice shutdown the plant, and spring floods repeatedly forced operations to cease. Because of those problems the company was forced to purchase electricity from the Utah Light and Railway Company.¹⁸

By 1910 Eccles's ambitions extended to the potentially rich market of Logan and Cache Valley. By organizing an electric streetcar system in Logan, he accomplished his desired goal. Compared to his Ogden Rapid Transit Company, his Logan company was small having only two lines. One was the Logan branch that ran between the Utah

¹⁷ Ibid., p. 72.

¹⁸ "Ogden Rapid Transit," Electric Railway Journal, 34 (November 12, 1910): 386-87, (Xerox copy, Utah State Historical Society).

State Agricultural College and the railroad depot on the westside of Logan. The other was the Smithfield branch which extended from Wellsville on the south to Smithfield on the North.¹⁹

Both the Logan Rapid Transit Company and the Ogden Rapid Transit found it necessary to expand in order to increase profits. Because the Logan company was the only electric railway in Cache Valley, it was able to expand northward to Preston, Idaho, and southward as far as Wellsville without interference. In Ogden the picture was quite different. The Ogden Rapid Transit had only one direction to go, and that was north because the Salt Lake and Ogden Railway (Bamberger Railroad) already had a line that ran southward from Ogden. Therefore, the company turned north towards Brigham City where it completed a line in 1911. In that same year it bought the Ogden and Northwestern Railway which had been operating an electric line to Brigham City since 1907 and took over the management of a small electric line that ran to Plain City, a small farming community west of Ogden (Figure 4).

In 1914 the two companies merged and formed the Ogden, Logan and Idaho Railway. The decision to merge was simple, but the choice of a route to link the lines was difficult. The first option was to build through Sardine Canyon to connect Wellsville and Brigham City. The second was to build from Wellsville to Huntsville. Both routes were unsatisfactory because they were steep and blocked by snow in the winter. Consequently, a third alternative, a route from Wellsville to Brigham City via Collingston, Utah, was chosen because the

¹⁹Swett, p. 75.

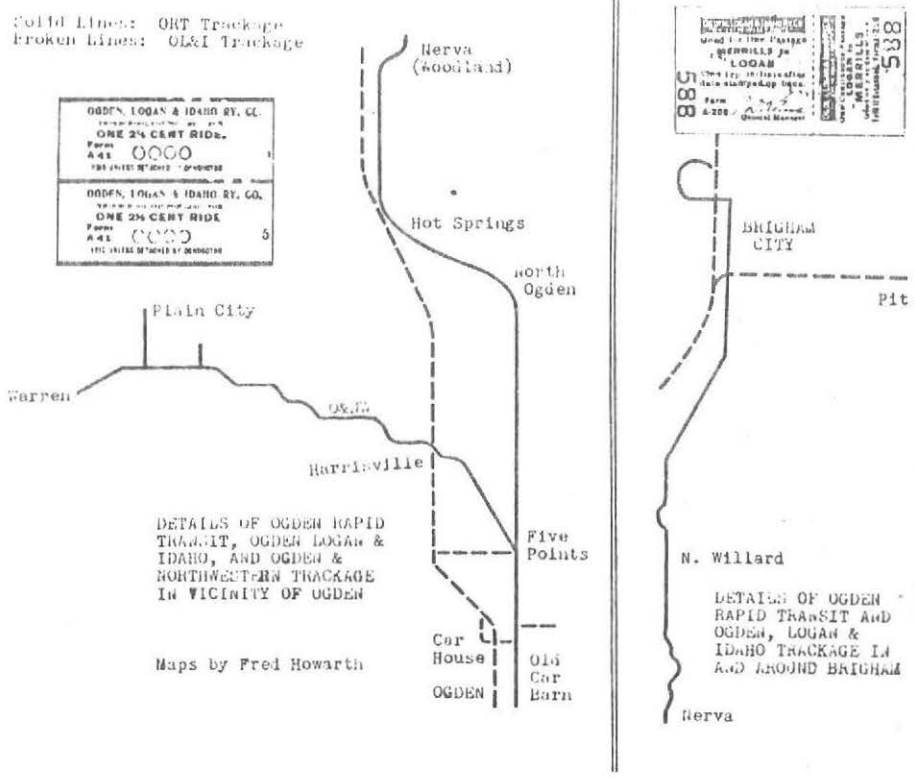


Figure 4. Details of the Ogden Rapid Transit, the Ogden, Logan and Idaho, and the Ogden and Northwestern railroads in the vicinity of Ogden and Brigham City. The solid lines represent Ogden Rapid Transit and Ogden and Northwestern trackage and the broken lines represent the Ogden, Logan and Idaho trackage.

grade was moderate and easily climbed by electric trolleys of the day (Figure 5). In 1915 the line was completed and service began. By building modern facilities, the Ogden, Logan and Idaho Railway became one of the most important electric interurbans in Utah.

Two major interurbans

Several years before David Eccles had begun to build his interurban, Simon Bamberger had started a project in 1891 to extend a steam interurban, the Great Salt Lake and Hot Springs Railroad, from Salt Lake City to Ogden. At the same time he hoped to build a line to Coalville, but this plan was dropped. By 1895 his line had reached Farmington. However, financial difficulties in 1895 and 1896 forced construction on the line to be suspended at Farmington. Shortly thereafter, the company was reorganized and renamed the Salt Lake and Ogden Railway.²⁰

By the beginning of the Twentieth Century, Bamberger's system had begun to prosper again, and steps were initiated to electrify the line. It was quite evident that the line could convert from steam because it had the necessary prerequisites, a prosperous route and a good roadbed which required little reconditioning for electricity. The conversion to electricity was finally completed in 1910 when the company finished building a steam plant near Farmington and three substations to boost the power along the route and erected trolley wires from Salt Lake City to Ogden. Passenger stations were constructed in Ogden and Salt Lake City, thus, Utah's

²⁰Ibid., p. 9.

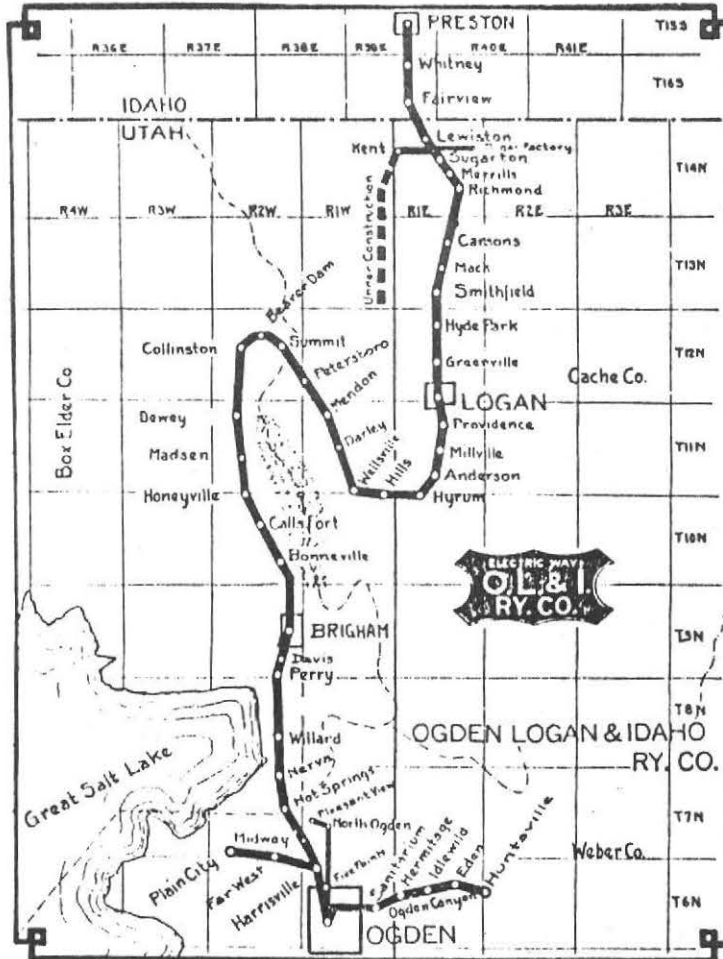


Figure 5. Map of Ogden, Logan and Idaho trackage in 1918.

first electric interurban was finished. Service continued until 1952 when the Bamberger Railroad sold the last of its equipment and ceased operations.

Shortly after the Bamberger Railroad was electrified, Walter Orem and Simon Bamberger proposed to build an electric interurban from Salt Lake City to Provo. It was named the Salt Lake and Utah Railroad, but it was also known as the "Orem Line" because Walter Orem was the moving force that pushed the line to completion. Construction began in 1912 and substations were built in Granger, Bringham, Lindon, and Springville. Because it did not own any power stations, it contracted with the Utah Power and Light Company for electricity. The line connected with the Bamberger Railroad in Salt Lake City and terminated in Provo on Center and First South Streets. During its heyday the Salt Lake and Utah Railroad together with the Bamberger Railroad and the Utah-Idaho Central (formerly the Ogden, Logan and Idaho Railroad) linked the important cities along the Wasatch Front. Business for the Salt Lake and Utah Railroad was extremely prosperous for several decades before changing times forced it to close in March 1946.

Electric interurbans had several important advantages over steam interurbans. First, electricity proved to be a cheaper source of power; as a result, fares were cheaper than those of steam lines. This in turn facilitated a lucrative passenger service between the major cities in Utah. Further, electric interurbans were more convenient because they ran into the main sections of towns where they usually joined with the city's lines. This resulted in more inter-city commuting by people. In addition, the electric interurbans

sponsored sight-seeing and other pleasure tours. However, passenger service was not the only source of revenue. Because the electric railway was able to make more stops and was still able to maintain a high rate of speed, trade became easier between the cities and rural areas. Thus, the two were brought closer together as time and distance became less important. This was especially evident in Weber County where the Ogden Rapid Transit opened more markets to the county's fruit and vegetable farmers benefiting the farmer, the merchant, and the consumer.²¹

During the years between 1889 and 1915, the electric railway progressed tremendously. It emerged as a novelty and grew to maturity by supplanting animal-powered trolleys and steam railroads as a source of transportation in the city and between cities. In doing so, it lost its uniqueness and became a common sight. It altered life styles. Suburbs and rural areas which were once remote were drawn into the mainstream of life in Utah as lines were extending into those regions. However, its real significance was that it literally carried Utah into the Twentieth Century.

²¹U.S., Department of Commerce and Labor, Bureau of the Census, Special Reports, Street and Electric Railways: 1902, pp. 110-11.

CHAPTER VI

RESULTS OF THIRTY-FIVE YEARS

Introduction

Thirty five years of electrification changed Utah drastically. Electric streetcars were found in her city streets and even ventured into the suburbs and rural areas. Powerful electric interurbans connected cities along the Wasatch Front into an excellent network of steel rails and electric transmission lines. Commerce and travel increased remarkably. Furthermore, electric lights illuminated streets, numerous public places, and homes. Even electric appliances were making their way to Utah. By 1915 the state's electric power companies had united into one efficient and economical system.

The electrification of the state was the outward manifestation of another change. By 1915 the transition from a Mormon-controlled economy to private enterprise was finished. In effect, Utah had become Americanized. Although the Mormon church was still an influence, it was not as powerful as it was thirty-five years earlier. It had been forced to cooperate and to unite with the state's leading Gentiles. This new pattern was manifested in the infant electric power industry when church leaders combined with non-Mormons to provide the state's citizens with electricity and its accompanying benefits.

Utah Power and Light: a giant in Utah

A new pattern was being established throughout the nation as small, local, and independent electric power companies merged to form large corporations capable of meeting the power demands of industry, railways, and homes. The mergers began in the most populous centers of the country and spread. At the beginning of the Twentieth Century, it had reached the mountain states of Montana, Colorado, Arizona, Idaho, and Nevada where large electric power companies like the Montana Power Company, the Public Service Company of Denver, the Tucson Gas, Light, and Power Company, the Public Service Company of Phoenix, the Idaho Power Company, and the Nevada Power Company were established. The Utah Power and Light Company was also a manifestation of this general trend.

The Utah Power and Light Company was organized as a subsidiary of the Electric Bond and Share Company of New York on September 6, 1912, for the purpose of consolidating the properties of the existing power companies in Utah, Southern Idaho, and Western Colorado. In 1912 it began by purchasing the Telluride Power Company including both its Utah and Colorado properties. During the following three years, it bought the Knight Consolidated Power Company, the Idaho Power and Transportation Company of Rexburg and Idaho Falls, and the Utah Light and Traction Company. In addition to those large predecessors, it absorbed 130 small independent companies.¹ After that mammoth consolidation was completed, it served an area bounded in the north by Rexburg, Idaho, in the south by Richfield, Utah, in

¹"Utah Power and Light," Electrical West, 129 (1962): 303-4.

the east by Ouray, Colorado, and in the west by Utah's mining fields in Tooele County. The only Utah towns outside Utah Power and Light's sphere of influence were those in Southern Utah in the vicinity of Cedar City which were controlled by the Dixie Power Company of Cedar City (later renamed the Southern Utah Power Company).²

Because Utah Power and Light had eliminated competition, it was able to concentrate on providing better electric service for its customers. By connecting its predecessor's plants and power lines, it created a powerful and efficient network that dispersed more than eighty-seven thousand kilowatts of electric energy. It finished an undertaking first envisioned by Lucien L. Nunn when it built a multipurpose reclamation project on the Bear River and Bear Lake, which furnished 125,000 kilowatts of power. Under these arrangements sufficient electric power was available throughout hundreds of square miles of territory previously dependent on other far more costly and unstable forms of power. By completing the unification into one system, scientific management was introduced into the conduct of the business of each property.³ Thus, management was improved. As extensive as Utah Power and Light's service was after that monumental integration, it did not extend its service to the farms in the area. They had to wait until the 1930s when the rural electrification programs brought them power.

² Jones and Jones, p. 171.

³ "Utah Power and Light," p. 306.

The social implications of electricity

Through those electrical advances made by Utah Power and Light, its predecessors, and numerous inventors, the lives of Utahns were altered appreciably. Those technological improvements shut the door on an age which would never reappear. Candles, gas and oil lamps, mule-drawn trolleys, and gas street lights disappeared as Utahns adopted electric lighting, appliances, and railways.

However nostalgic the previous period might have been, the new one offered more labor-saving conveniences than the people had ever dreamed were possible. New, exciting electric appliances were rapidly appearing. For the housewife, flatirons and washing machines were being introduced by 1900. Thus, washday (traditionally Monday) no longer lasted from sunrise to sunset. Furthermore, slaving over a hot coal or wood stove was reduced when electric stoves were invented and appeared in Utah.⁴ Because those time-consuming tasks were sharply reduced, the housewife had time for other activities like social and political reform activities which in turn contributed to women finally getting the right to vote. By the second decade of the Twentieth Century, electric alarm clocks, electric heating, and Edison electric phonographs had made their debuts making life more comfortable and enjoyable.

The most notable advancement was the electric light. Electric lamps for interior lighting brightened the long and previously dimly lighted winter nights and eliminated the smokey candles and oil or

⁴Salt Lake Tribune, December 30, 1901, p. 60.

kerosene lamps. The Utah Light and Railway was so proud of its lights that it advertised in the Salt Lake City and Ogden newspapers that they were as bright as sunlight and were pure, clean, convenient, and safe. Moreover, electric street lamps beamed forth a bright light along streets that were still unpaved and muddy during and after rain or snow. Thus, they gave the streets a safe and secure atmosphere at night.

Equally significant were the electric railways which offered a variety of social benefits. They sponsored sightseeing tours and offered charter service to various clubs and organizations. Because the obnoxious smoke and black cinders that belched from coal- or wood-fired engines was eliminated by electric engines, social intercourse increased. As a result, more people were travelling for business or recreation than ever before.⁵ Further reasons for the increase in travel was that the electric interurbans were cheaper, faster, and more convenient than its predecessor. As revolutionary as interurbans were for transportation, electric city lines also changed life styles. The slow, plodding mule- or horse-drawn streetcars (many argued it was faster to travel a foot than by mule streetcars) were replaced by fast electric streetcars. Besides being faster they were cheaper to maintain; consequently, fares were lower. Furthermore, the streetcar companies sold transfer tickets which allowed a passenger to ride to any point in the city without paying fares on every car that he rode.

⁵U.S., Department of Commerce and Labor, Bureau of the Census, Special Reports, Electrical Railways: 1917, p. 140.

However, the transition from sporadic electric power for electric lights, appliances, and railways to a continuous service was slow. At first, it was common to have electric power from dusk to 10 P.M. or occasionally midnight on "Dance Night." As service became more refined, the electric companies generated electricity more hours during the day. Finally, electricity was produced all day and every day.

One aspect of electrification was the fact that very few people knew how to operate the light. For example, Ivy Bailey was completely frustrated the first time that she tried to turn on a light. The encounter occurred the morning of her marriage to William N. Barker in 1909. When she arose that morning to dress herself after spending the night in a hotel which had electricity, she dressed and combed her hair in the dark because she did not know how to turn on the electric light in her room. When her fiancée arrived to escort her to the marriage ceremony, he was completely aghast to discover that she did not know how to turn on the light. Immediately, he turned on the light by screwing the bulb into the light socket. Naturally, he teased her because of her ignorance concerning the electric light. Miss Bailey was not the only person who did not understand how to use the light because others like Juanita Brooks allegedly stuck the glowing light in a dresser when she tried to turn off a light for the first time. However, people soon mastered the intricacies of the light.

The Mormon influence

During the early 1880s when the electric power movement first began, the Mormon church was yielding its hegemony in Utah in the face of strong federal pressures. Particularly influential in forcing the church to give in was the controversial Edmunds-Tucker Act of 1887 which undertook to destroy the temporal power of the church by dissolving the church as a corporation and forcing it to surrender its property to the United States Government.⁶

Consequently, there was a noticeable decline in Mormon activity in trade and industry. Non-Mormons began to play a more important role in the economy by initiating private enterprise; and for the first thirteen years of the new electric era Gentiles conspicuously dominated the industry without any interference from Mormons.

However, as the Mormons yielded on polygamy, the church re-asserted itself in some economic fields. Particularly important was its encouragement of its leading members to cooperate with non-Mormons in building private enterprises. The major areas in which the Mormons and Gentiles began uniting were the manufacturing of sugar and the building of hydroelectric plants. In each of those areas, the church played the predominant role in getting the industry established using its somewhat meager resources to rescue those industries during the depressions of the 1890s.⁷

The emergence of the church came at a rather crucial time for the electric power companies in the state. At that time the Salt

⁶Arrington, pp. 360-65.

⁷Ibid., pp. 386-94.

Lake and Ogden Gas and Electric Company (the major company in the state at the time) was floundering because it could not finance new equipment because of the nationwide depression. By promoting the Pioneer Electric Power Company and the Big Cottonwood Power Company and selling the two companies' power to the Salt Lake and Ogden company, the church did much to avert a crisis because the Salt Lake and Ogden company had the necessary lines, poles, and franchises to operate and the two Mormon-sponsored companies had the power to sell. The church later sponsored the consolidation of the above companies forming the Union Light and Power Company in 1897 which was the most extensive power company in Utah during the last decade of the Nineteenth Century.

With one exception the church-promoted power companies prospered. The only failure was the Union Light and Power Company. Because it could not compete against the Utah Power Company and technical difficulties, it was reorganized as the Utah Light and Power Company in 1899. Four years later, Utah Light and Power merged with the Consolidated Railroad Company of Salt Lake City forming the Utah Light and Railway Company which was extremely prosperous and exceedingly progressive as noted in an earlier chapter.

The Mormon church had helped a sagging enterprise into prosperity. With its prestige loans were obtained in Europe and in some eastern sections of the United States to back the Pioneer Electric Power Company, the Big Cottonwood Power Company, the Union Light and Power Company, the Utah Light and Power Company, and of course, the Utah Light and Railway Company. For Utah Power and Light this was important because the properties of the above

companies formed a solid nucleus of the Utah Power and Light system. When Utah Power and Light bought the properties, the Mormon church lost all ownership of the forementioned properties and was forced out of an industry that it helped shape into a viable and important segment of Utah's economy. The church's motives for promoting electric power companies and other enterprises in the 1890s and the early 1900s were not entirely altruistic. By the 1890s it recognized the profit motive and hoped to fill its depleted coffers. Nonetheless, the material welfare of its members was never forgotten.

Observations

Once Charles F. Brush proved electric lighting to be practical the advantages of electricity came quickly to Utah. Naturally, one wonders why; Utah was remote and in many ways primitive and backward. However, several reasons why electric power arrived so quickly and developed rapidly may be suggested. First, Utah's population was concentrated in one area providing financial support, labor to construct and operate the facilities, and the market to sell the electricity. Second, the people, largely Mormon, were well-educated and receptive to technological advances and had a desire to prove that they were progressive and not primitive. Geographically, Utah was a crossroad for transportation and communications which allowed an influx of new ideas to enter easily into the territory. Last, Utah had sufficient natural resources like coal and water to generate electricity. Mountain streams especially along the Wasatch Front provided energy for hydroelectric power. Harnessing water to generate electric power was difficult and

early attempts failed because stream flow was erratic. However, with the utilization of dams and canals hydroelectric power expanded so rapidly that by 1917 it provided the bulk of the electricity in the state.⁸

As important as the above factors were, eastern capital and technology were equally if not more important. Throughout the period under discussion, Utah's power companies relied upon eastern electric companies like the Heisler Electric Company of St. Louis for equipment and expertise. Easterners like Lucien L. Nunn moved to Utah seeking financial profits and as a result built up the industry. Without eastern capital, the progress of the 1890s and early 1900s would have been impossible. The Mormon church lacked the means, and no group of Utahns could have raised the money without outside assistance. As a result, capitalists like Joseph Bannigan and Edward H. Harriman played a major role in developing the electric power industry in Utah. The epitomy was, of course, the incorporation of Utah Power and Light Company in 1912 by the Electric Bond and Share Company of New York. Consequently, the electric power industry of Utah was indebted to outside capital and technology as well as nature resources like water and progressive people for its development.

A story completed

Thus, after thirty-five years the period of early development was complete. The state's electric supply was no longer provided by a

⁸Electric Railways: 1917, p. 88.

myriad of small, local, and independent companies which fought among themselves. The incorporation of Utah Power and Light not only stopped that ruinous warfare but also improved the generation and distribution of electric power. The future that men like Lucien L. Nunn, Jesse Knight, and other prominent Utahns envisioned had arrived. Countless dreams and aspirations of the people were also realized as electricity lighted homes and public places and furnished power for Utah's growing industry. Furthermore, it was an example of Utah's absorption into the mainstream of American Life.

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