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HISTORY OF THE CONSTRUCTION OF THE SALT LAKE TEMPLE

A Thesis

Presented to the

Department of History

Brigham Young University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Wallace Alan Raynor

August 1961

PREFACE

The construction of the Salt Lake Temple is an inextricable element of Utah and Mormon history. From the moment of its inception in 1847 until its completion forty-six years later its development coincides closely with the political and economic history of the territory. Its history epitomizes the faith of the Mormon people, attests to the strength of their conviction and serves as a monument to their efforts.

It has been a rewarding experience to write the history of the construction of an edifice which has had, and continues to have, such a marked impact on Utah culture.

The writer wishes to acknowledge the assistance given him by the Utah State Historical Society, the University of Utah Library, Chad Flake of the Brigham Young University Special Collections Library, and to A. William Lund and his fine staff, especially Lauritz Petersen at the L.D.S. Church Historian's Office for free access to their invaluable archives.

I express appreciation to my wife whose encouragement and assistance have lightened the burden of composition; to Robert W. Edwards whose knowledge of Utah transportation has been most helpful and for the fine maps he drew for this work;

to Lynn Millgate, the Temple engineer; and to William Kuhre and Thomas B. Childs, whose experience in years was invaluable. Particularly am I grateful to Dr. Richard D. Poll whose patience and scholarship are largely responsible for the historical contribution of this work.

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CHAPTER I

LATTER-DAY SAINT VIEWS ON THE HISTORY AND SIGNIFICANCE OF TEMPLES

Holy buildings have existed since the beginning of the history of man. Many of these structures have been called temples. A temple is, as defined, "A holy sanctuary, an edifice erected in honor of deity, a place in which the Divine Presence actually resides."[1]

Biblical history asserts that the history of the Israelite people is the history of a people who believed temples were necessary to meet the covenants of their faith. Since the Church of Jesus Christ of Latter-day Saints professes a similar belief and identifies itself with many of the covenants and doctrines of Biblical times, those temples, ancient and modern, which may have influenced the development of the Salt Lake Temple will be mentioned briefly by way of historical background.

Biblical Background.--As the Israelites escaped their bondage in Egypt and began their sojourn in the wilderness, Jehovah, the God they professed to serve, commanded them to

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[1]Joseph Angus, The Bible Handbook (London: The Religious Tract Society, 1908), p. 123.

build a Tabernacle. The plan was revealed in the minutest detail and the Tabernacle was constructed from the finest materials available. This Tabernacle served as their sanctuary while they were a transient people.[2]

With the permanent settlement of the Israelites a site was chosen for building a temple. Soon after Solomon's accession to the throne the tremendous task of construction was begun.[3] The walls of this Temple were built of hewn stones. Each stone was cut in the mountains according to a prescribed plan and then transported to the Temple site.

The Temple was divided into compartments for the different ordinances of the priesthood. One of these beautifully designed compartments served as the Holy of Holies.[4] The inner court of the Temple had a large baptismal font of brass more than five yards in diameter, which stood raised on the backs of twelve carved oxen. In architecture and construction, in design and costliness it is one of the most remarkable buildings in history. In about 1005 B.C., after seven and one-half years of labor, the Temple was completed and dedicated. With the exception of size, the inner part of Solomon's Temple followed very closely the earlier design

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[2]Exodus 25:10-40; 26:1-21.

[3]I Kings 6:2.

[4]The Works of Josephus, comp. William Whiston (4 vols.; New York: Armstrong and Sons, 1897), I, 221.

of the Tabernacle. In all essentials of arrangement and proportion they were so alike as to be almost identical.[5]

Thirty-four years after completion the Temple was plundered by the Egyptian Shisak.[6] In the next few centuries the work of desecration continued and in 599 B.C. Nebuchadnezzar carried away the last few treasures and then set the Temple afire.[7]

Under the friendly rule of Cyrus the Jews began the construction of a new Temple. This Temple was called Zerrubbabel, and was patterned after the Temple of Solomon, though not being so luxurious. After twenty years of labor the Temple was dedicated in 515 B.C. This Temple stood for five hundred years and was in a state of ruin and decay when Herod in the year 16 B.C. commenced to reconstruct the ancient sanctuary.[8] Though the greater portion of the work was done in the first nine and one-half years the reconstruction was not completed until 63 A.D.[9]

In the year 70 A.D. Titus invaded Jerusalem, and the battle was carried into the Temple. In a violent siege,

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[5]James E. Talmage, House of the Lord (Salt Lake City: Deseret News, 1912), p. 138.

[6]I Kings 14:25-6.

[7]II Kings 24:13; 25:9.

[8]Talmage, pp. 9-10.

[9]Ernest Renan, History of the People of Israel (5 vols.; Boston: Roberts Bros., 1936), V, 245.

the building was plundered, desecrated and burned.[10]

The Mormon Church believes that from the time of the destruction of the Temple at Jerusalem until the nineteenth century the Temple of God[11] in the distinctive sense was not upon the earth.[12] The Mormon Church further believes that during these years there was no need for temples because the Holy Priesthood was not upon the earth.

Earlier Latter-day Saint Temples.--A Mormon declaration of faith states, "We believe that through the Atonement of Christ, all mankind may be saved, by obedience to the laws and ordinances of the Gospel."[13] The Mormon Church believes that some of these laws and ordinances are defined in the Bible and that others have been revealed to the Church through Joseph Smith and his successors. The revelation that Joseph Smith proclaimed on February 9, 1831, to construct a temple in the Lord's name so that instructions could be given pertaining to the Priesthood and in doing work for the dead must be adhered to. To a Church so strongly believing in revelation,

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[10]Josephus, IV, 266-7.

[11]The Book of Mormon states that a Temple patterned after the Temple of Solomon was constructed on the American continent in the year 570 B.C. See II Nephi, 5:16.

[12]Talmage, p. 11.

[13]"Articles of Faith," No. 3 (Salt Lake City: Church of Jesus Christ of Latter Day Saints, 1953).

this is sufficient to establish the need for the building of temples.[14]

Within the confines of the Temple certain ceremonies are performed either for the living, present in person, or vicariously for the dead, by an individual living proxy. The living are but few compared to the dead, so the Temples are largely for the benefit and salvation of the uncounted dead.[15] Briefly summarized, these ceremonies are: (1) To fulfill the law of baptism, specifically for those who have died, (2) To complete the ordinations and endowments necessary to gain an understanding of man's creation, his earthly purpose and the plan for eternal salvation, (3) To fulfill the covenant of eternal marriage, and (4) To seal the children to their parents for time and all eternity.[16]

The Church of Jesus Christ of Latter-day Saints was organized on April 6, 1830, with Joseph Smith Jr. as its proclaimed prophet, seer and revelator. Eight months later, in December, 1830 Smith announced that he had received a revelation in which the Lord said, "I will soon come to my Temple."[17] On February 9, 1831, another revelation exhorted the people to

---

[14]Joseph Smith, Doctrine and Covenants (Salt Lake City: Church of Jesus Christ of Latter-day Saints, 1953 ed.), 124:27-44.

[15]Talmage, p. 88.

[16]Ibid., pp. 89-108.

[17]Doctrine and Covenants, 36:8.

invest their surplus goods in the purchase of lands and houses of worship so "that my people may be gathered in one on that day when I come to my Temple."[18] In July of 1831 a commandment was made known by Joseph Smith, that the present location of Independence, Missouri was to be the center of the Church and that the Temple should be built. The site was subsequently purchased and was dedicated by President Smith on August 3, 1832.[19]

This Temple in Missouri has never been constructed, opposition forcing the Mormons to leave the region soon after the cornerstones were laid. According to Latter-day Saint belief, it is intended to be a magnificent structure, far larger than the Tabernacle in Salt Lake City and is to have twenty-four compartments arched together in circular form with many supporting buildings surrounding it. It will be impervious to decay,[20] and will be completed by the Saints before the second coming of Christ.[21]

The next site designated for a Mormon Temple was in Kirtland, Ohio. On September 22, 1833, Joseph Smith was

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[18] Ibid., Sec. 42:36.

[19] Joseph Smith, History of the Church of Jesus Christ of Latter Day Saints: Period I (6 vols.; Salt Lake City: Deseret News, 1902), I, 199.

[20] Sermon by Orson Pratt, Salt Lake City, Oct. 26, 1879. Journal of Discourses (26 vols.; Salt Lake City: Church of Jesus Christ of Latter Day Saints, 1879), XXIV, 24-7.

[21] Ibid., Salt Lake City, May 20, 1855, III, 17-8.

commanded to build a Temple, and was told that ample time was granted for the completion of this edifice, and that "this generation shall not pass away until a house shall be built unto the Lord."[22] On December 27, 1833, explicit instructions were announced in regard to the construction and design of this "House of the Lord":

> The House of the Lord for the Presidency is eighty-seven feet long and sixty-one feet wide. . . .
>
> The pulpits are to be finished with panel work, in the best workmanlike manner; and the building to be constructed of stone and brick of the best quality.
>
> . . . . . .
>
> Let the foundation of the house be of stone; let it be raised sufficiently high to allow of banking. . . . On top of the foundation, above the embankment, let there be two rows of hewn stones, and then commence the brick work. . . . Make the walls sufficient thickness for a house of this size.
>
> . . . . . .
>
> The roof of the house is to have one-fourth pitch, the door to have Gothic top, the same as the windows. The shingles of the roof to be painted before they are put on. . . . A belfry is to be in the east end, and a bell of very large size.[23]

The cornerstones for the Kirtland Temple were laid on July 23, 1833.[24] After three additional years of toil and sacrifice the Temple was completed and dedicated on March 27, 1836.[25] The building faced to the east, measured eighty feet

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[22] Doctrine and Covenants, 84:4-5.

[23] Smith, I, 359-62.

[24] Ibid., p. 400.

[25] Ibid., II, 380-82.

from east to west, its width was fifty-nine feet, the walls were fifty feet in height, and from the base of the structure to the top of the tower it measured one hundred and ten feet.[26] The completed cost of the edifice was estimated to be between $70,000.00 and $100,000.00.[27]

Shortly after the completion of the Kirtland Temple, outside opposition and internal friction forced the Saints to abandon their city, and though attempts were made to lease the Temple to reliable concerns, it soon fell into the willing hands of the villagers. A door was hewn into the basement, where cattle, sheep and swine were sheltered during the winter months. The pulpits were used as a manger for the storage of hay and straw, the wooden pews were used for firewood and the fine linens of the Temple were used for patchwork. The second story became a community recreation center, used for traveling entertainers, political campaigners, and community dances, games and festivities and the third floor, which had housed the School of the Prophets, carried for many years the echoes of the local schoolmaster.[28]

Moving to the west and settling principally in Far West, Missouri, the Mormon people undertook the building of

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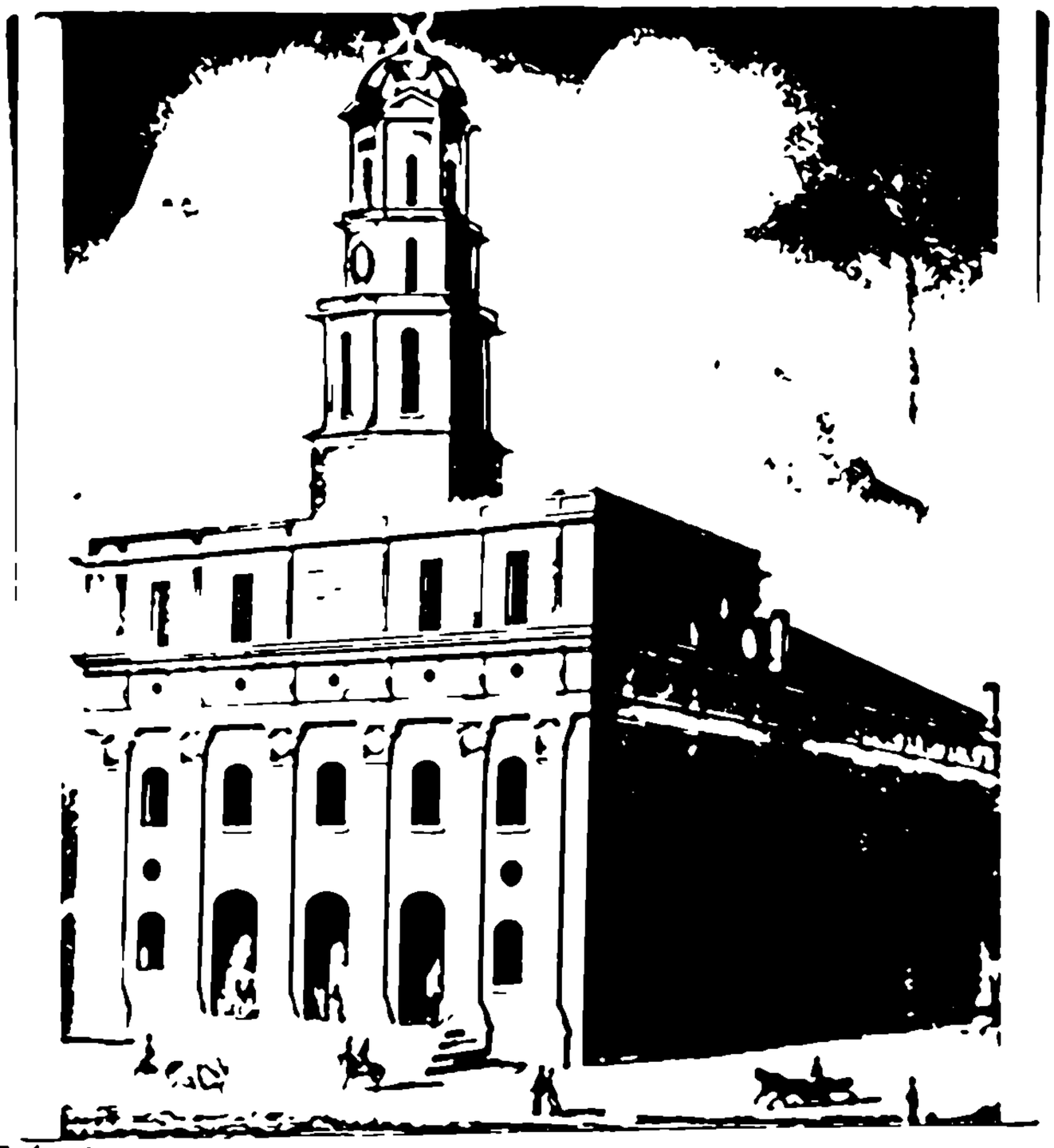
[26]Talmage, p. 115.

[27]N. B. Lundwall, comp., Temples of the Most High (eighth ed.; Salt Lake City: Bookcraft, 1952), p. 7.

[28]Ibid., p. 43. President James A. Garfield attended school in this building.



Upper picture - NAUVOO TEMPLE Lower picture - KIRTLAND TEMPLE

Utah State Historical Society.

another Temple to the Lord. Smith stated that on April 26, 1838, the Lord had commanded him to build a Temple in Far West and to commence laying the foundation stones on July 4, 1839.[29] The months that followed were times of persecution and the hostile townsmen repeatedly asserted that the cornerstones would never be laid. Nevertheless, on July 4, as commanded, the Temple cornerstones were laid and on April 26, 1839, work was begun on the foundation. Shortly after the work was started the Mormon people were once again forced to abandon their city.[30]

Settling next in Nauvoo, Illinois, the Mormon people again undertook to build a Temple. Joseph Smith declared that on January 19, 1841, the Lord had appeared and said, "Come ye, with all your gold, and your silver, and your precious stones, and all your antiquities. . . . And with iron, with copper, and with brass, and with zinc, and with all your precious things of the earth; and build a house to my name, for the Most High to dwell in."[31]

The most beautiful site within the city was selected and set aside as the Temple site. On April 6, 1841, a large crowd of dedicated people, led by a brass band and sixteen

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[29] Doctrine and Covenants, 115:7-18.

[30] Talmage, p. 125.

[31] Doctrine and Covenants, 124:26-7.

colorful companies of the Nauvoo Legion, formed in procession and marched to the Temple foundation where Smith laid the southeast cornerstone.[32] The other cornerstones were laid by members of the Priesthood in a manner prescribed by President Smith.[33] Work progressed steadily, but the Temple had only risen to the square of the first story when Joseph Smith was assassinated in the Carthage, Illinois, jail. With his death on June 27, 1844, and the prospect of expulsion of the Saints from Nauvoo, increased impetus was placed to finish the Temple and in less than a year, on May 24, 1845, the capstone was laid and the shout of "Hosanna! Hosanna! Hosanna! to God and the Lamb Amen! Amen! and Amen!" was led by Brigham Young.[34] The Temple was formally dedicated on April 30, 1846.[35]

The Nauvoo Temple was built from a light gray limestone material. It was one hundred and twenty-eight feet long and eighty-eight feet wide, sixty-five feet high at the sides, and to the top of the spire one hundred and sixty-five feet. The spire was surmounted by the figure of a flying messenger sounding a trumpet. There were thirty pillasters or buttresses

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[32]B. H. Roberts, A Comprehensive History of the Church of Jesus Christ of Latter Day Saints (6 vols.; Salt Lake City: Deseret News Press, 1930), II, 67.

[33]Talmage, pp. 128-9.

[34]Roberts, pp. 472-3.

[35]Talmage, p. 135.

supporting the exterior walls, which ran from the foundation to the cornice and at the ground level of each buttress, there was a crescent moon hewn in relief. Near the top of each buttress there were thirty stones which allegorically depicted the face of the sun. Above these stones, just below the cornice were thirty star stones. The total cost of the building was $1,000,000.00, paid for by penny funds, tithing labor, tithing and free will donations.[36]

Being once more driven from their homes and Temple, the Mormon people moved westward toward the valley of the Great Salt Lake. Enemies of the Church, desiring to destroy every vestige of Mormonism set the Temple on fire on November 19, 1848. Only the walls were left standing, when on May 27, 1850, a tornado swept across the country and leveled the last mark of the second Temple built by a dedicated people for their God.[37]

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[36]Lundwall, pp. 51-2.

[37]Talmage, p. 135.

CHAPTER II

BEGINNING OF THE SALT LAKE TEMPLE

A Slow Beginning.--On July 28, 1847, four days after the arrival of the Mormon people in the Great Salt Lake Valley, Brigham Young, prophet of their faith and leader of their exodus, accompanied by Heber C. Kimball, Willard Richards, Orson Pratt, Wilford Woodruff, and several others, walked from their north camp to a section of land located between two creeks in the heart of the valley. Brigham Young waved his hand and said, "Here is the forty acres for the Temple. The city can be laid out perfectly square north and south, east and west."[1] It was moved and seconded that the Temple lot was to be set aside and to contain forty acres.[2]

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[1]Another account claims that Brigham Young struck the ground with the point of his cane and said, "Here we will build the Temple of our God." See "Temple Square in Salt Lake City," LXII, No. 19 (a pamphlet published by the L.D.S. Church, Salt Lake City, Utah), p. 6. A Mormon tradition recalls that on this occasion Wilford Woodruff drove a wooden stake into the small hole made by President Young's cane. On February 14, 1853, shortly after the ground was surveyed, it was noticed that the exact center of the plot laid out by the survey for the Temple was where Wilford Woodruff had placed the stake nearly six years before. See Lundwall, p. 137.

[2]Note by Wilford Woodruff. Journal History, July 28, 1847, pp. 2-3. The Church of Jesus Christ of Latter-day Saints, Historian's Office, Salt Lake City, Utah.

A few days later when the city was being planned and laid out, it was decided that forty acres was too large and a council was held to determine whether or not to reduce the area to twenty acres. After considerable discussion it was decided that ten acres would be sufficient.[3]

In the ensuing few years no actual construction was undertaken on the edifice. With no reserves, and thousands of their companions a thousand miles to the east, the Mormon people busied themselves in preparing the way. Forts were constructed, crops planted, houses erected and all of the countless other tasks needed to develop a new country had to be done before work could start on another temple. To meet their needs and to utilize the large labor force available, the Public Works was organized on January 26, 1850. Small craft shops were built, men were employed and under the direction of the Church a purposeful focus was made to build the Kingdom of God in the Salt Lake Valley.[4] Thus it was not until the April Conference of the Church in 1851, four years after the arrival, that a motion to build the Temple was made and carried by acclamation. Daniel H. Wells was appointed as a Committee of One to supervise the building of the Temple

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[3]Edward W. Tullidge, History of Salt Lake City (Salt Lake City, Utah, 1886), pp. 47-8.

[4]Manuscript History of Brigham Young, January 26, 1850, p. 2. L.D.S. Historian's Office.

and also the Public Works.[5]

During the following year, the people were continually exhorted to pledge their means and efforts toward the project and on February 14, 1853, a large body of saints assembled on Temple Block for the groundbreaking ceremony. The site was surveyed by Jesse W. Fox, under the supervision of the Church Architect, Truman O. Angell.[6] President Young then spoke for about thirty minutes, recounting the many vicissitudes through which the Church had passed and describing how providence had driven them to the shelters of the Salt Lake Valley.

With regard to the Temple plan he said,

> Some might query whether a revelation had been given to build a House of the Lord, but he is a wicked and slothful servant who doeth nothing but what his Lord commandeth, when he knoweth his Master's will. I know a Temple is needed and so do you; and when we know a thing, why do we need a revelation to compel us to do that thing? If the Lord and all the people want a revelation, I can give one concerning this Temple. In a few days I shall be able to give a plan on paper, and then if heaven or any good man on earth, will suggest any improvements, we will receive them and adopt them.
>
> Brother Joseph often remarked that a revelation was no more necessary to build a Temple than a dwelling house; if a man knew he needed a kitchen, a bedroom, a dining room, a parlor, etc., he needed no revelation

---

[5]Deseret News Weekly (Salt Lake City), April 19, 1851, p. 1.

[6]Truman O. Angell was the sustained architect of the Church from 1850 until his death in 1887. The Temple was his taskmaster and to it he gave his life. He, more than any other, is responsible for its architectural design. See Appendix I for biographical sketch.

> to inform him of the fact; and I and my brethern around me know what is wanting in a Temple, having received all the ordinances belonging therein, just as well as we do what is wanting in a convenient dwelling-house.[7]

After an interlude of music and song, Heber C. Kimball offered a prayer consecrating the ground. The Presidency then led the procession to the South-east corner of the Temple site, where they loosened a piece of earth about one foot square. During the groundbreaking ceremony a one dollar silver piece fell on the square foot of earth and no one knew from whence it came but President Kimball prophesied that it was a good token and means would not be wanted to build the Temple. President Young then lifted his spade and cast the first shovelful of earth aside for the building of the Temple.[8]

The President addressed the multitude, and declared the ground broken for the Temple, blessed the people in the name of the Lord, and dismissed the assembly. Some went home, but many stayed throughout the afternoon and began preparing for the laying of the foundation.

Plans and Supervision.--The Church has never had an official policy in regard to the architectural design of

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[7] Deseret News Weekly (Salt Lake City), February 14, 1853.

[8] Ibid.

its buildings.[9] The President of the Church, as the prophet, seer and revelator, though continually availing himself of the services of the professional architect, is the final source of approbation.

It will be remembered that Joseph Smith gave explicit instructions in matters related to the Kirtland Temple.[10]

The Nauvoo Temple produced the following incident which exemplifies the relationship between Joseph Smith and the architect:

> In the afternoon, Elder William Weeks (whom I employed as architect of the Temple), came in for instruction. I instructed him in relation to the circular windows designed to light the edifice in the dead work of the arch between stories. He said that round windows in the broad side of the building were a violation of all the known rules of architecture, and contended that they should be semi-circular--that the building was too low for round windows. I told him I would have the circles, if he had to make the Temple ten feet higher than originally calculated; that one light at the center of each circular window would be sufficient to light the whole room; that when the whole building was thus illuminated, the effect would be remarkably grand. "I wish you to carry out my designs. I have seen in vision the splendid appearance of that building illuminated, and will have it built according to the pattern shown me."[11]

Regarding the Salt Lake Temple, Brigham Young, during the ground breaking ceremonies in February of 1853, clarified his role in relationship to the architectural design.

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[9]Interview with Edward O. Anderson, L.D.S. Church Architect, May 9, 1959.

[10]Supra, Ch. I.

[11]Joseph Smith, History of the Church, VI, 196-7.

> Concerning this house, I wish to say, if we are prospered we will soon show you the likeness of it, at least upon paper, and then if any man can make any improvement in it, . . . he is at liberty to do so. But wait until I dictate, and construct it to the best of my ability, and according to the knowledge I possess, with the wisdom God shall give me, and with the assistance of my brethren; when these are exhausted, if any improvement can be made, all good men upon the earth are at liberty to introduce their improvements.[12]

Two months later, while dedicating the cornerstones, Brigham Young indicated the general plan of the Temple.

> I scarcely ever say much about revelations, or visions, but suffice it to say, five years ago last July I was here, and saw in spirit the Temple not ten feet from where we have laid the chief cornerstone. I have not inquired what kind of a Temple we should build. Why? Because it was represented before me. I have never looked upon that ground, but the vision of it was there. I see it plainly as if it was in reality before me. Wait until it is done. I will say, however, that it will have six towers, instead of one.
>
> Now do not any of you apostatize because it will have six towers, and Joseph only built one. It is easier for us to build sixteen than it was for him to build one. The time will come when there will be one in the center of Temples we shall build and on the top, groves and fish ponds. But we shall not see them here, at present.[13]

On the 26th of May, 1850, Truman O. Angell was appointed architect of the public works at $3.00 per day.[14]

---

[12] Journal of Discourses, I, 277-8.

[13] Ibid., I, 133. Wilford Woodruff many years later reported a dream he had had before coming to the Rocky Mountains. In the dream he saw a fine looking temple which was built of cut granite stones. Every time President Young or one of the twelve mentioned building the Temple out of adobe or brick he would say to himself, "No, you will never do it," because of his dream. Journal of Discourses, XXI, 299-300.

[14] Kate B. Carter (comp.), Heart Throbs of the West (Salt Lake City, Utah: Daughters of the Utah Pioneers, 1939), p. 222.

He was sustained as the official architect of the Church in the April Conference of 1852.[15]

In fulfillment of his promise Brigham Young drew upon a slate in the architect's office a sketch and said to Truman O. Angell,

> "There will be three towers on the east, representing the President and his two Counselors; also three similar towers on the west representing the Presiding Bishop and his two Counselors; the towers on the east the Melchisedk priesthood, those on the west the Aaronic priesthood. The center towers will be higher than those on the sides, and the west towers a little lower than those on the east end, the body of the building will be between these and pillars will be necessary to support the floors." Angell then asked about the height, and drew the following vertical section according to Brigham Young's instruction: The basement sixteen feet high to contain the font. The first story twenty-five feet high between the pillars, but between the pillars and sidewalks fifteen feet high leaving room for a tier of rooms above the side aisles about ten feet high, below the second floor. The second story like the first.[16]

Angell commenced work on the design of the building and on March 9, 1855, asked the young stonecutter, William Ward, to be his assistant. By April 28, 1855, the architects

---

[15]Wendell J. Ashton, Theirs is the Kingdom (Salt Lake City, Utah: Bookcraft & Co., 1945), p. 139. Truman O. Angell's sister was the second wife of Brigham Young. He learned the joiner's trade and worked on the Kirtland Temple. So pleased with his work was Joseph Smith that the prophet told him one day, "I'll give you work enough for twenty men." He served as assistant architect on the Nauvoo Temple, and when William Weeks, the architect, left for Utah, Mr. Angell finished the edifice. Upon his arrival in Salt Lake City, he was asked to submit plans for a council house. The plan was submitted and accepted. His life's work was thus determined. See ibid., pp. 75-91. See also, Appendix II.

[16]Statement by William Ward, Deseret News, April 16, 1892.

had completed the plans for the foundation and part of the basement story, Angell developing the general design and Ward handling the detail work of each course. The plans had been submitted to Brigham Young and had been officially approved.[17]

By August 17, 1854, plans were far enough along that Angell submitted a descriptive statement giving the general plan and specifications of the Temple to the Deseret News. The plan was complete except for the specification of the spires which the architect reported had not been finally determined.[18]

During the years 1855-56 when work was curtailed on the Temple Angell was sent on an architectural mission to Europe. He recorded in his diary:

> I was asked by President Brigham Young at his table to visit Europe. . . . President Young consecrated Truman O. Angell as a missionary [and said] "You shall have power and means to go from place to place, from country, and view the various specimens of architecture that you may desire to see, and you will wonder at the works of the Ancients and marvel to see what they have done: and you will be quick to comprehend the architectural designs of men in various ages, and you will rejoice all the time, and take drafts of valuable works of architecture, and be better qualified to continue your work and you will increase in knowledge upon the Temple and other buildings, and many will wonder at the knowledge you possess."[19]

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[17] Truman O. Angell, Diary, March 9 - April 28, 1855. L.D.S. Historian's Office.

[18] Deseret News, August 17, 1854. The specifications coincide very closely with those given by the architect in 1874. See next section and Appendices for comparisons.

[19] Truman O. Angell, Diary C, April 3, 1856.

The plan for the Temple was well advanced and with a flury of last minute instructions to William Ward and the various foremen, he left for Europe, arriving in Liverpool, England, on July 13, 1856. In the next six months he visited and carefully noted the architectural features of such buildings as the Houses of Parliament, the National Gallery, and Astley's Amphitheatre. He spent August 25-27 going through St. Paul's Cathedral from "bottom to top." He visited sugar factories, iron works, and ship building yards. Writing in his diary of the Nelson monument he said,

> It is a Doric Column standing on a pedestal, from the ground to the top of its capitol 130 feet; and around this cap to the crown of the Nelson it is 25 feet; size of the column at neck; it is fluted, winding stairs ascend the column; the cylinder was about five feet eight inches.[20]

The similarity between the newelled staircases which stand in each corner of the Temple and the Doric Column in the Nelson Monument is more than coincidence. Each stands over one hundred feet in height. Both columns are fluted and cylindrical in form. Each column serves as the center support for an ascending spiral staircase.

Later in the fall he journeyed to France and noted the unique architecture of Paris. On January 27, 1857, he received a letter from Brigham Young asking him to return home as he was needed on the Temple.[21] Returning to his drawing

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[20] Ibid., August 17 - October 16, 1856.

[21] Angell, Nov. 19, 1856 - January 27, 1857.

board he found an immense amount of work waiting to be done. Ward, his talented assistant, had quit his position and had returned to St. Louis.[22] Further, within a few months the prospect of invasion by the United States led to the boxing and caching of all drawings, instruments, and plans and the burial of the completed portions of the Temple foundation and walls.

For Angell this was only an interruption. The subsequent story of Temple planning and supervision will be considered after the pre-Utah War construction is reviewed and certain special aspects of labor and resource development and organization are analyzed.

The Foundation.--Work on the Temple was pushed forward steadily from the commencing of the initial labor, and on February 21, 1853, Wilford Woodruff was appointed to superintend the digging of the foundation.[23]

The early work was done by tithing labor, each of the wards being expected to furnish men on designated days. For example, on February 24, 1853, the Fourteenth Ward was to

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[22]Carter, p. 70. Ward later returned to Utah and taught drawing at the University of Utah. Soon after Angell left for Europe, Ward proposed the construction of a scale model of the Temple made from plaster of paris. To what extent, if any, work was done on the model is not known to the writer. See Appendix III for an interesting account of this proposal.

[23]Manuscript History of Brigham Young, February 21, 1853, p. 32.

furnish laborers and on that date the Church Office Clerk reported that the brethren of the Fourteenth Ward were diligently at work digging out the foundation for the Temple and that fourteen teams were engaged in making the excavation.[24]

April 6, the twenty-third anniversary of the Church, was the time appointed to lay the cornerstones. As a result, there was not time to make a complete excavation, so trenches about twenty feet wide and sixteen feet deep were dug, extending from the southeast corner along the south, west, north and east sides.[25] The two trenches running north and south measured one hundred and ninety-three feet in length, while the trenches running east and west measured one hundred and twenty-five feet, excavated in such a manner as to provide for the contour of the towers. The additional six and one-half feet beyond the length and width of the building provided for a three foot footing extending beyond the base of the wall.[26]

There never seemed to be a lag until the job was completed. The Deseret News reported:

> The excavation for the Temple is progressing rapidly. About two hundred of the brethren are daily engaged in the work, under the immediate direction of Elder

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[24] Deseret News, Feb. 24, 1853.

[25] James H. Anderson, "The Salt Lake Temple," The Contributor, XIV, No. 6 (April, 1893), 252.

[26] Letter to Franklin D. Richards from George Albert Smith, Salt Lake City, July 31, 1854, Millenial Star, October 7, 1854.

> Wilford Woodruff, and all that seem [sic] to retard their operation is the lack of teams to receive the rock from the spade.[27]

On March 25 the cornerstones were placed in position to be laid. In a general epistle the Saints were informed that between seven and ten thousand days labor had been expended in digging the foundation, and were asked to imagine how many days work would be required to complete the excavation for the walls.[28]

On a beautiful Wednesday morning, April 6, 1853, thousands assembled on Temple Block to witness the laying of the cornerstones. A long procession formed in the old Tabernacle and moved to the southeast corner of the foundation site to carry out the same ceremonies which Joseph Smith had prescribed for the Nauvoo Temple.[29] There, with band music and the voices of the choir filling the air, the First Presidency and the Patriarch proceeded to place into position the southeast cornerstone.[30] President Young gave the oration, after which, Heber C. Kimball offered the consecration prayer.

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[27] Deseret News Weekly, March 5, 1853.

[28] Ibid., Apr. 2, 1853.

[29] Roberts, II, 68-9.

[30] It was the general procedure among builders of this period to lay the first cornerstone in the northeast corner. Brigham Young, commenting on this, evidently asked the older brethren where they went for light. The response was to the east. He then replied, "So we commence by laying the stone on the southeast corner, because there is the most light." See Journal of Discourses, ~~II~~ I, 131-36.

The procession then moved to the southwest cornerstone where the Presiding Bishop and the various Presidencies of the Lesser Priesthood proceeded to lay the cornerstone. Bishop Edward Hunter delivered the oration and the spot was consecrated by Bishop Cordin.

The procession again formed, and marching to tunes of martial music, proceeded to the site of the northwest cornerstone. The stone was placed in position by the Presidency of the High Priests' Quorum and the High Council. President John Young delivered the oration and George B. Wallace offered the consecratory prayer.

The congregation proceeded to the northeast cornerstone, which was to be laid by the Twelve Apostles, The First Presidency of Seventies and the Presidency of the Elders' Quorum. The apostles assembled near the stone as Elder Parley P. Pratt delivered the oration and Elder Orson Hyde offered the consecratory prayer.[31]

Two months additional work was required to complete the excavation before it was possible to commence work on the rock foundation. A report to Brigham Young on May 31, 1855, by the Church office clerks, Thomas Bullock and Leo Hawkins, stated that about one hundred men from the Public Works were

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[31] Deseret News Weekly, April 6, 1853. The offices referred to in this ceremony all pertain to the Priesthood organization of the L.D.S. Church.

very busy rolling down large rocks[32] for the Temple foundation, which was nearly completed all around, and had commenced laying the flagging of cut stone.[33]

By the end of June, 1855, the massive foundation was up to a height of eight feet,[34] and within the month it was finished and work was commenced on the inverted arches and buttresses.[35]

The foundation was sixteen feet thick at the base and depressed sixteen feet below the surface of the ground at the east end. The excavation was widened three feet beyond the perpendicular of the walls to provide for a three foot footing. From its sixteen foot base the walls sloped three feet on each side to the height of seven and one-half feet. The footings of the towers were the same as the sides, solid masonry, composed of rough, fitted stones, called ashlars,

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[32]A plan for a crane to handle the stone was drawn by Truman O. Angell, the Church Architect, on July 13, 1852. Order bills were issued for its construction on the 15th inst., but whether it was ever assembled and used is not known by the writer. See Truman O. Angell, Diary, A, July, 1853, L.D.S. Historian's Office.

[33]Manuscript History of Brigham Young, May 31, 1855, p. 58.

[34]Ibid., June 30, 1855, p. 72.

[35]Letter to John Taylor, Great Salt Lake City, Utah, July 25, 1855. Brigham Young's Letterbooks, No. 4, p. 252. L.D.S. Historian's Office.

laid in good lime mortar.[36] The rock used for the foundation was a reddish silicious conglomerate. Each stone weighed one hundred and forty-eight pounds to the cubic foot, and was firmly cemented in position.[37] The amount of rock taken to complete the foundation up to the commencement of the basement at the eight foot level was 101,056 cubic feet and would weigh approximately 14,956,288 pounds or a fraction over 7,478 tons.[38]

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[36]Truman O. Angell reported in his architectural sketch of the Salt Lake Temple, that when the Temple footing was laid the masons contended that mortar was best when composed of four, five, or even six parts of sand to one of lime. Mr. Angell contested the selection, but nevertheless, the foundation was laid in that proportion of mortar. The architect then made several proportions of mortar: 1 to 1; 1 to 2; 1 to 3; 1 to 4; 1 to 5; of lime and sand and buried them in the ground for five years. When the mortar was taken up, that of one part of lime to two parts of sand was the best. The rest of the building until at least 1874 was laid in that type of mortar. See Truman O. Angell, "The Salt Lake Temple," Millenial Star, XVI, No. 18 (May, 1874), 271.

Don Carlos Young, grandson of Brigham Young, has done extensive repair work on the Temple. He states that the mortar used in the construction of the Salt Lake Temple walls was made from high calcium lime and the best river sand thoroughly washed and mixed in about the proportions of one lime to three sand. The mortar was always well mixed by machine grinding and in the early stages of the work the mortar was buried in pits placed in the ground. The samples that have been dug up from early work show this mortar to be hard and more tenacious than the granite itself. Interview with Don Carlos Young, May 17, 1959.

[37]Deseret News Weekly, Aug. 17, 1854.

[38]Manuscript History of Brigham Young, August 11, 1855, p. 89. This was one-third more rock than it took to build the entire Temple at Nauvoo. Millenial Star, October, 1855, p. 632.

Labors on the Temple had continued relatively unabated for the past two years but due to a general failure of the harvest in 1855-56 and the lack of teams to haul rock for the Temple, Daniel H. Wells announced that:

> Circumstances render it impossible to go on with the Public Works; we have enough work to do but do not have provisions to keep the laborer. . . . We have got along from hand to mouth in order to conduct the matter on the present limited scale, and are obliged to stop operations until after the harvest.[39]

With men and teams in the fields only a few blacksmiths and other skilled tradesmen labored on the Temple Block.

Renewed efforts in the spring of 1857 saw a small crew of about twenty stonecutters begin work on the Temple,[40] and on June 18, a small company watched Edward Parry lay the first stone of the basement story in the northeast corner of the foundation.[41] The Deseret News reported that "All along the foundation walls, huge stones, averaging about two tons in weight, were strewn in readiness for being placed in their positions, while numerous stonecutters were busily occupied in shaping the rude blocks from the quarry."[42]

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[39]Sermon by Daniel H. Wells, March 9, 1856, Millenial Star, August 9, 1856, p. 499.

[40]Manuscript History of Brigham Young, March, 1857, p. 92.

[41]This is inconsistent with the procedure followed in laying the cornerstones.

[42]Deseret News, June 24, 1857.

In the annual epistle to the saints from the First Presidency, the many vicissitudes of 1856-57 were recounted. The high cost of the immigration program, the loss of crops and animals, the heavy indebtedness had all but curtailed labor on the public works. Yet, ingrained among the discouragements was hope for a prosperous 1858. The winter, which was now upon them, was to be a time of preparation.[43] The Bishop's storehouses were to be filled, tithing paid, the skilled craftsmen were to return to the Temple Block, and the public works were to be placed in readiness for building the Temple in the spring.

The Public Works.--Temple Block, marking as it did the center of the city survey and the spiritual center of the Church, became a major focus of activity years before the Temple construction began. It was there that the shops and mechanical trades so imperative in building a new country developed. With the building program being directed by the Church, and the responsibility of taking care of the people entering the valley devolving upon them, the directed labors soon became known as the Public Works. It was here that a new family entering the valley was supplied with the necessary sustenance and supplies to begin its new life. If the newcomer were a craftsman, it was here that he hoped to ply his trade.

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[43]Millenial Star, April, 1857, p. 246.

Rapidly growing in scope and function, and in order to maintain efficiency, the Public Works was departmentalized on January 26, 1850. Bishop Newel K. Whitney was to receive and distribute funds belonging to the Public Works, with Daniel H. Wells as first assistant and Truman O. Angell as second assistant. Samuel Ensign was chosen as foreman of the carpenters, Norton Jacobs, foreman of the joiners, Alonzo H. Raleigh, foreman of the masons and Reynolds Cahoon as timekeeper. It was decided to pay the mechanics $2.50 per ten hour day with the architect receiving $3.00 daily.[44]

Temporary shops were constructed and housed the tools and machinery which were so vital to the development of a new country and in order to protect these supplies, equipment and manufactured goods and to furnish work for those entering the valley, a large wall completely encompassing the Temple Block was planned. It was to be constructed preparatory to laying the foundation of the Temple,[45] and work started toward that end on August 3, 1852. The harvest season soon interrupted. The wall proved to be a low priority project, and though far enough along to close up the block at night by August, 1855,[46]

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[44]Manuscript History of Brigham Young, January 26, 1850, p. 2.

[45]Deseret News Weekly, April 7, 1851.

[46]Letter to F. D. Richards from George A. Smith, Great Salt Lake City, May 31, 1855. Millenial Star, August, 1855, p. 508.

it was not completed until May 23, 1857. The base of the wall was cut red sandstone extending to a height of four feet. Surmounting the base were courses of adobe extending an additional ten feet, and then followed a coping of sandstone one foot in height, giving the wall a total height of fifteen feet.[47] The wall had four huge openings, one in each side, and was completely covered by a durable dressing of cement.[48]

Within the enclosure was the industrial heart of the valley. On the northwest wall, west of the north gate, was the foundry, which under the direction of Morgan Phelps was busily engaged turning out wagon tires and other metal castings. Adjoining the foundry was the blacksmiths' shop with seven fires in operation, turning out the tools and repairing the wagons so vital to progress. Located on the south bank of City Creek,[49] which flowed through the northern sector of

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[47]James E. Talmadge, House of the Lord (Salt Lake City: Deseret News, 1912), p. 138.

[48]The wall as initially planned was to be surmounted by a six foot wrought iron picket fence. See Manuscript History of Brigham Young, October 6, 1852, p. 83.

[49]This small creek which initially served so many purposes flowed through the valley in three separate channels. One channel flowed in a north-westerly direction, another channel flowed to the east parallel to and above Temple Block. The center fork flowed in a westerly direction and made its egress slightly north of the present west gate. See Andrew Jenson (ed.), The Historical Record (Salt Lake City, 1886), p. 288. Its depth is reported to have been between six and eight feet. See, The Contributor, April, 1893, p. 259.

the enclosure, was the machine shop under the foremanship of Nathan Davis and on the west end of the machine shop, facing City Creek, was the carpentry shop, the foreman of which was Miles Romney. The Carpenters' shop was a two story structure, the top of which housed William Pitt's paint crew. A breast-wheel, sixteen feet in diameter, spanned City Creek and turned the lathes for the machinist and carpentry shops and from this water wheel, by means of a fan, the air was pumped through a wooden flume six inches in diameter and two hundred and ninety-seven feet in length to operate the air blast in the blacksmiths' shop.[50] A cursory glance through the account books will show that everything from sugar to coffins was manufactured in the shops of the old public works.

Chief among building materials were rock and lumber. The former was abundant and quarries were opened in the canyons to the east of the city[51] and lumber was readily available in the surrounding canyons. As early as March 6, 1848, the High Council at Great Salt Lake City sent the

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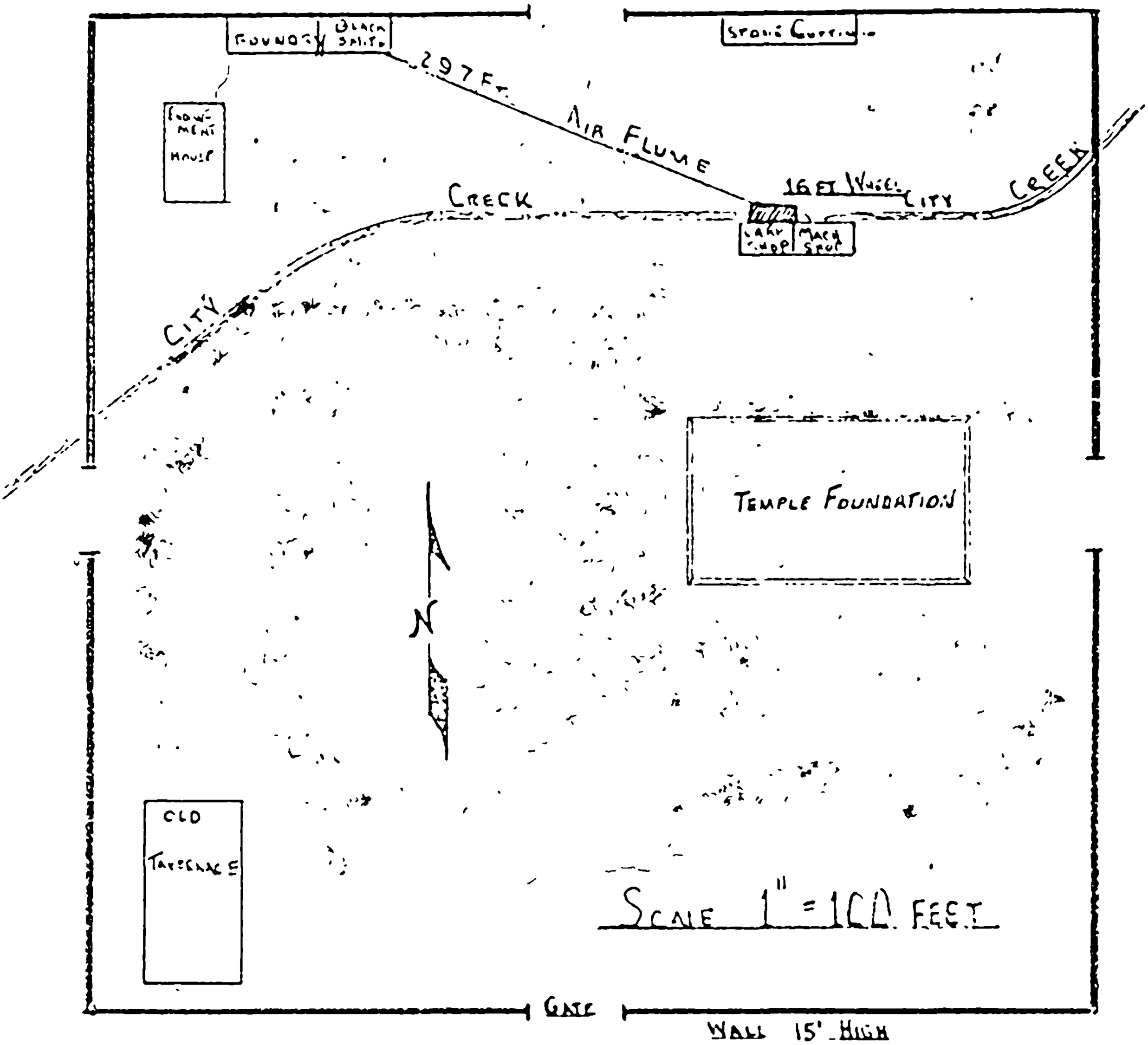
[50]This material is based upon the information gathered from three sources: Letter to Editor of the Mormon by George A. Smith, Great Salt Lake City, May 31, 1855. Millenial Star, August, 1855, pp. 533-4; James H. Anderson, "The Salt Lake Temple," The Contributor, April, 1893, p. 259; Leonard J. Arrington, Great Basin Kingdom, 1830-1900 (Harvard University Press, 1958), p. 109.

[51]The quarries are such an integrated part of the Temple construction that they are treated separately in Chapter III.

PUBLIC WORKS



Sixteen foot waterwheel.

Photo collection:
Utah State Historical
Society.

following information to President Brigham Young at Winter Quarters:

> Brother Chase has a sawmill in operation on a spring a short distance from the Pioneer Garden . . . between 8th and 9th south and 2nd and 3rd east Archibald and Robert Gardner have a small sawmill nearly ready for sawing on Mill Creek. Brother Crimson has the frame and gearing of a sawmill nearly ready to put up. Brothers Nebeker, Riter and Wallace are progressing rapidly with a sawmill in a canyon some ten miles north of the city.[52]

Soon many lumber companies in the valley had portable steam sawmills and with the mills giving 10 per cent of their lumber to the church there never seemed to be a lumber shortage. In the summer of 1855, for example, the public lumber sheds had 150,000 board feet of lumber on hand for the builders.[53]

With the lumber sheds full, wagons and teams ready to commence the long trip to the quarry, and the public workshops fully staffed, only the unforeseen could thwart progress on the Temple in the next four years.

The Burial.--On July 24, 1857, Brigham Young and twenty five hundred guests and associates were in Big Cottonwood Canyon celebrating the tenth anniversary of their entrance into the valley when news was received that almost one-sixth of the regular United States Army was on its way

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[52]"Sawmills," L.D.S. Historian's Office, Steel File. This article lists an up and down sawpit operating in Red Butte Canyon by the Chase brothers as early as February, 1848.

[53]Millenial Star, August, 1855, p. 533.

to Utah. Its intent and purpose was to back the U.S. Territorial officials in establishing a complete separation of church and state and to see that the inhabitants of the territory abided by the laws prescribed by the U.S. government.[54]

The course of action was soon determined. On the 15th of September Brigham Young, acting as Utah Territorial Governor, issued a proclamation forbidding armed forces from entering the territory, requiring the militia to be in readiness to march and to repel an invasion, instituting martial law throughout the territory and forbidding travel and commerce without a permit.[55] As a result, when the army approached Utah they met with stiff resistance. Their supply trains were captured and all entrances to the Salt Lake Valley were blocked. With the onset of winter the army encamped at Fort Bridger and Fort Scott awaiting reinforcements and planning for the spring campaign.[56]

During the ensuing winter several attempts at conciliation were instigated and through the efforts of Thomas L. Kane and the favorable reports sent to Washington by the new governor, Alfred Cumming, a peace commission was sent to

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[54]For a detailed account of the charges and their veracity against the Mormons see Roberts, IV, 188-227. See Andrew Love Neff, History of Utah: 1847-1869 (Salt Lake City, Utah, 1940), pp. 457-8.

[55]Neff, p. 472.

[56]Ibid., pp. 475-82.

Camp Scott and on into Utah. On April 6, 1858, President Buchanan issued a proclamation which offered "to forgive the inhabitants of the Territory for the alleged acts of disloyalty, providing they would become law-abiding American citizens."[57] On June 11, 1858, the President's proclamation was accepted with one provision--"the troops should not be stationed in the proximity of the settlements."[58]

This fear of the military and distrust for governmental promises was deeply imbedded in the Mormon people. They were determined that this would not be another experience such as those in Missouri and Illinois. It was the intention of the people, if a peaceable conciliation was not made, to burn their homes, destroy their growing crops and to flee to the southern settlements and so, when the United States Army entered the valley, they found a deserted city, earmarked for destruction. Only a few guards remained, ready on an instant's notice to set the abandoned city ablaze.[59]

As the army made their triumphant march past the Temple Block, nothing was to be seen of the Temple through the locked iron gates, for on the 23rd of March, President Young had issued instructions to the workmen of the public works

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[57] *Ibid.*, pp. 487-91.

[58] *Ibid.*, pp. 510-11.

[59] *Ibid.*, pp. 501-7.

to cache the stones, and to plow around the Temple walls, burying the foundation with dirt.[60] In a letter to John M. Bernhisel, President Young stated, "By May 6, the Temple foundation was cached, the public shops removed, except what was required to fix the wagons, shoe the animals, etc., and the former Temple site looks like nothing more than a freshly plowed field."[61]

In twenty-seven years these people had planned for the construction of five temples. One was never begun, the cornerstones were laid for another, two others had been completed, dedicated, evacuated and then desecrated and destroyed. The fifth, to be the finest of all, now lay buried, and its completion awaited a change in times and events. But it was only postponed, for one man's purpose remained steadfast and on April 12, 1858, "The President remarked to Brother Smith, 'I do not feel the least gloom over the city, nor have not felt but what we shall remain here and finish the Temple.'"[62]

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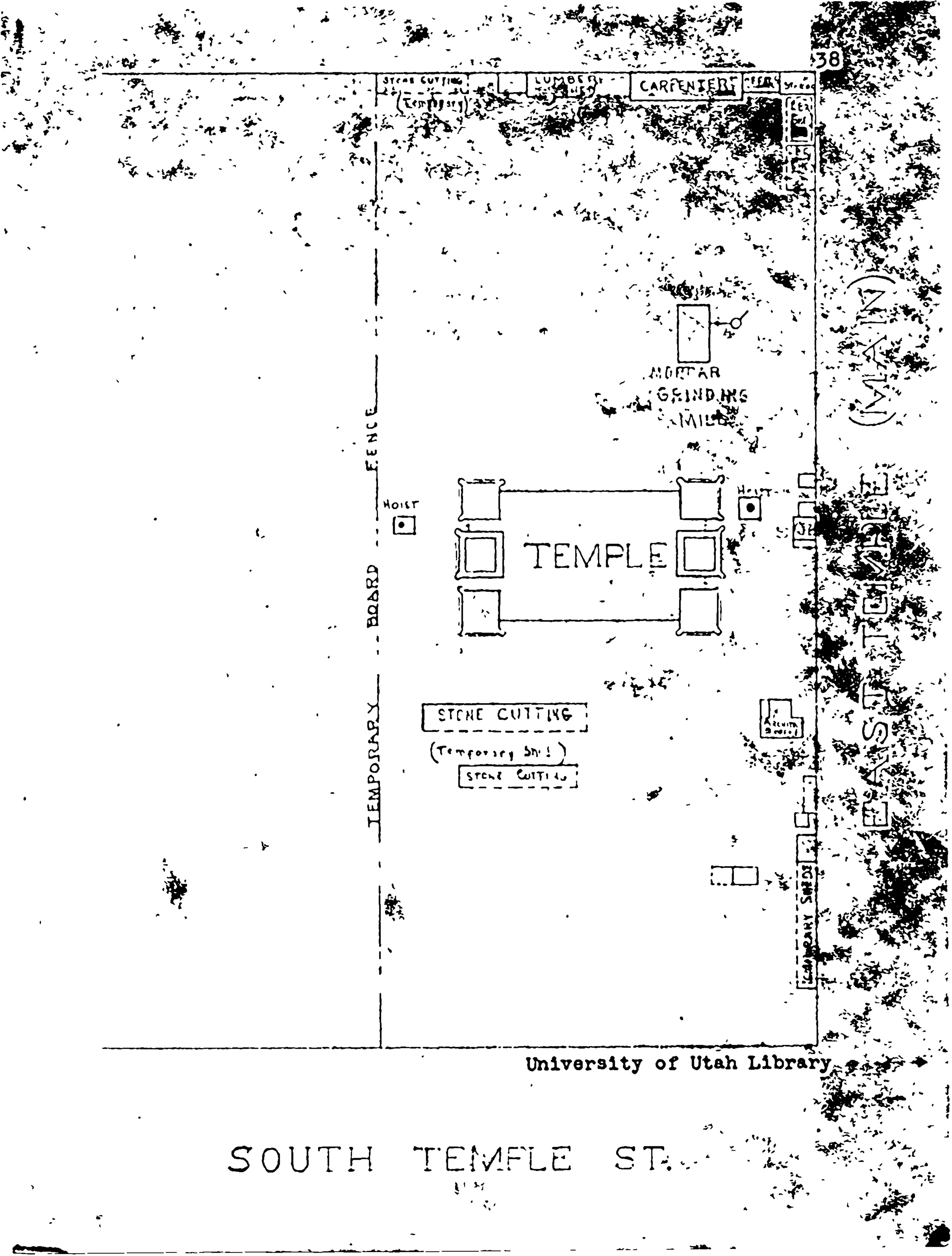
[60]Manuscript History of Brigham Young, March 30, 1858, p. 1.

[61]Letter to John J. Bernhisel, Great Salt Lake City, Utah, May 6, 1858, Brigham Young's Letterbooks, No. 4.

[62]Manuscript History of Brigham Young, April 12, 1858.



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CHAPTER III

THE ECONOMICS OF TEMPLE BUILDING

Introduction.--The historical development of the Salt Lake Temple from an economic standpoint is inextricable with the economic development of the territory as a whole. It was probably the largest single project undertaken by the Trustee-in-Trust of the L.D.S. Church, working through the Public Works. The initial delay in commencing construction of the Temple was occasioned by the dire straits in which the new settlers found themselves upon entering the valley. That the project could be launched in 1853 is evidence of the accumulation of some capital reserves from tithes, trade with the Gold Rush, and other sources, and the arrival of immigrants in sufficient numbers to provide both a labor force and an employment problem. The curtailment of labor in 1855-56 followed the devastating attack of the grasshoppers and a winter of unusual severity and length which destroyed hald of the cattle in the valley.[1]

The ensuing year the people reaped the largest harvest

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[1]Leonard J. Arrington, Great Basin Kingdom, 1830-1900 (Harvard University Press, 1958), p. 151. The Trustee-in-Trust is the sustained business executive of the Church.

since their arrival in the valley,[2] and the public hands returned to their labors on the Temple foundation.

The arrival of the army into Salt Lake Valley in the summer of 1858 caused a complete curtailment of Temple labor and the destruction of much which had already been done. The abundance of cash and goods brought into the valley by the arrival of such a large force of men and the accompanying need for fresh supplies and goods, many of which were only obtainable from the local people, brought large sums of cash into the coffers of the Trustee-in-Trust. William Clayton stated the typical political view when writing to George Q. Cannon in England:

> The Great Buchanan Expedition, cost the Government millions, and accomplished nothing, except making many of the Saints comparatively rich, and improving the circumstances of most of the people of Utah.[3]

Upon the exodus of the army, surplus goods valued at $4,000,000.00 were purchased by the people of the territory for $100,000.00 with approximately 40 per cent of these goods being bought by Brigham Young.[4]

During the following period of relative prosperity the foundation of the Temple was opened and much of it was replaced. The basement rose above the level of the ground,

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[2]Neff, p. 250.

[3]Millenial Star, August, 1861, p. 566.

[4]Arrington, p. 199.

a new quarry site was opened, and a canal was begun. In 1868 the Church accepted a contract from the Union Pacific Railroad for $2,125,000.00 to grade approximately one hundred and fifty miles of railbed and nearly five thousand men were called by Brigham Young to complete this project. Shortly after this agreement another contract was accepted to grade two hundred miles of the Central Pacific line for $4,000,000.00.[5] Work was almost completely curtailed on all projects of a public nature during this period and, though the terms of the contract were not adhered to, and the anticipated profits never completely realized, the railroad did much toward the development of the natural resources found so abundantly in the valley.

Although many of the subsequent developments of an industrial nature were not under the aegis of the Church, many indirect benefits were realized. One such benefit was the rich ore strike at Alta in the Little Cottonwood Canyon above the Temple quarry site. The construction and operation of the railroad for the sole purpose of hauling granite would have been a formidable expense as the granite shipments made up a small part of the over-all profits reported by the Railroad Company, and with the discontinuance of mining in the Alta

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[5] Ibid., pp. 261-3.

region railroad operations were soon abandoned.[6]

With the exception of a few localized tithing recessions following the panic of 1873, Church receipts remained at approximately $500,000.00 yearly until the 1880's[7] when they rose even higher. The Temple in this decade rose from ground level to well over one hundred and twenty-five feet in the air but with the passage of the Anti-Bigamy and Anti-Mormon legislation of 1882 and 1887, Temple building was again curtailed and the building was completed only after considerable tribulation and heavy indebtedness.

Mormon Economic Policy for Financing the Salt Lake Temple.--A maxim of Mormonism in the early period, and indeed, philosophically true to this day, is "All that is, is the Lord's." In Kirtland, Ohio, on February 8, 1831, Joseph Smith revealed to his people the law of consecration and stewardship which required that each Church member voluntarily surrender all of his property to the Church for the upbuilding of the Kingdom of God and in return, each would serve as a steward over a portion of the consecrated properties sufficient for his family needs. One of the express purposes for the surplus

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[6]On the average of three granite shipments daily, only $18,780.00 of the reported $150,000.00 profit as reported in 1877 would have come from the Quarry business. See Chapter V, p. 118.

[7]Arrington, p. 400.

funds of the consecration principle was to build houses of worship.[8]

For sundry reasons, the law of consecration proved inadequate. Chief among these reasons were a predominance of poor over rich, the reluctance of the people to accumulate tangible wealth and the difficulty of holding on to it in such a fluctuating economy.

On July 8, 1838, in answer to a supplication by Joseph Smith concerning the finances of the church, another revelation was announced:

> Verily, thus saith the Lord, I require all their surplus properties to be put into the hands of the bishop of my church in Zion,
>
> For the building up of mine house, and for the laying of the foundation of Zion and for the priesthood, and for the debts of the Presidency of my church.
>
> And this shall be the beginning of the tithing of my people.
>
> And after that, those who have thus been tithed shall pay one-tenth of all their interest annually; and this shall be a standing law unto them forever, for my holy priesthood, saith the Lord.[9]

The first tithing collected in the Salt Lake Valley was in November of 1848, seventeen months after the initial entrance. In 1850 the General Tithing Office and the Bishop's General Storehouse were opened on the city block directly east

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[8]Doctrine and Covenants, 42:30-5.

[9]Ibid., 119:1-4.

of the Temple and by May of 1852, $250,000 had been collected and receipted by the General Tithing Office.[10] In a like manner but on a smaller scale each ward and community established a tithing office or bishop's storehouse which was under the control of the bishop or the presiding elder.

Assuming the responsibility for the collection and disbursement of all Church funds was the Trustee-in-Trust. Brigham Young was appointed Trustee-in-Trust by a general vote of the people in conference of 1848. The office received legal sanction by the Territorial Legislature in 1851.[11]

All of the Church property was held in the name of the Trustee-in-Trust until 1862, when the "Anti-Bigamy Act" was passed.[12] This act was introduced in the House by Justin S. Morrill of Vermont in April of 1862, and, signed by President Lincoln, became a law on July 8, 1862. The law was designed "to punish and prevent the practice of polygamy in the Territories of the United States, and to disapprove and annul certain acts of the territorial legislature of Utah," especially the act which incorporated the Church and any stipulations which tended to sanction or support polygamy.[13]

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[10] Leonard J. Arrington, "Mormon Economic Policies and Their Implementation on the Western Frontier" (unpublished Ph.D. dissertation, Dept. of Economics, University of North Carolina, 1952), p. 131.

[11] Arrington, Great Basin Kingdom, p. 133.

[12] Ibid.

[13] Neff, p. 866.

Section three of the act made it unlawful for a religious association in a territory of the United States to have any real estate in excess value of $50,000.00. All properties in excess of this amount were to be escheated to the United States.[14] With the inception of this bill most of the properties of the Church were transferred to private parties in trust and a large number of these property titles were simply conveyed to the Trustee-in-Trust in a private capacity.

The Trustee-in-Trust of the Church is sustained in his official capacity by the members of the Church in a short parliamentary meeting at the commencement of each conference. The President of the Church has served as the Trustee-in-Trust except from 1873-75 when this role was assumed by George Albert Smith, a counselor to Brigham Young, and from 1887-97 when the office of Trustee-in-Trust was eliminated by action of congress and the Church properties were held by officially appointed government receivers.[15]

Regarding the official position and business function of the Trustee-in-Trust, Arrington writes,

> In eras of growth and in time of famine, the Trustee-in-Trust was the agent through which thousands of church members, in the Great Basin and elsewhere, were able to combine their savings and labor to develop the resources

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[14] U.S. Congressional Globe, 37th Cong., 2d Sess., 1861-62, Appendix, p. 385.

[15] Arrington, p. 455.

and increase the production of their deficit economy. In directing and financing the construction of canals, roads, sugar factories, iron works, and public buildings; in working with private enterprise to forward the economic development of the Great Basin; in sheltering fledging enterprises and communities from the storms of economic misfortune; and in devising schemes for immigrating the poor, from Babylon, the Trustee-in-Trust functioned as the church steward. . . . The Trustee-in-Trust was the agent by which group savings and group investment were attempting to convert, under great natural obstacles, a lonely and unwanted desert waste into a prosperous, beautiful, and cooperative Kingdom of God.[16]

In the Articles of Incorporation, the Church was granted the right to hold real and personal property. Such property was to be administered with righteousness and justice and was to be "used, managed, or disposed of for the benefit, improvement, erection of houses for public worship and instruction, and the well being of said Church."[17]

The revenue received by the Church and disbursed by the Trustee-in-Trust had highly divergent origins, among which were revenues from railroads, businesses, mines, industrial enterprises, taxes, tolls, donations and tithings. Five different classifications were used to denote tithing revenues: (1) Property tithing was a levy of 10 per cent on all property held by the individual when he joined the Church or commenced adherement to the tithing commandment, (2) Labor tithing consisted of donating one day in ten toward the various projects

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[16] Ibid., p. 160.

[17] Utah Historical Quarterly, VIII, 224.

Copy

Report of Expenditures on Salt Lake City Temple

From October 1877 to April 1881.

Compiled from reports of the Superintendents of each department

Stakes	Cash		Stock		Sundries		Labor		Totals	
Salt Lake	5745	50	578	50	3973	00	31085	31	41382	31
Tooele	1467	50	886	25	797		3825	21	5975	96
Weber	112		751	25	327		8912	28	10072	53
Utah	1070		1746		21480	70	40879	62	26176	32
Summit	108				191		757	05	1056	05
Davis	190		92		1059	50	10932	25	12273	75
Wasatch	81		418		339		986	70	2066	70
Morgan	137	50			163		1506	28	1806	78
Sundry Donations	632	65					7097	15	7729	80
	8524	15	4442	00	9352	20	85981	85	108500	20
By Trustee in Trust for Jos Jacks report during the above period									469906	57
									578406	77
The above report was presented to President Taylor & Council Brought for Recorded										

Temple Expenditure Account Book, Oct. 1877-Apr. 1881, L.D.S. Historian's office.

carried on by the Church, (3) Produce and Stock tithing was one tenth of the yield of farm or factory at the time of production, (4) Cash tithing included donation in U.S. currency, Deseret scrip, or gold dust, and other forms of store money, (5) Institutional tithing was a levy on the profits of stores and businesses.[18] From these sources, and other contributions, the Temple was financed.

Means of Finance.--Though the people had been commanded to live the law of tithing, anticipated revenues were not forthcoming.[19] In 1852-53 letters were written to Church members in California and England, asking them to send their tithes and Temple offerings to Salt Lake City. During the summer of 1854 a circular was sent to the bishops throughout the territory exhorting them to "forward to the Tithing Office in Great Salt Lake City, all available tithing funds as fast as they came into their hands, as the same were needed for the Temple and the public works of the Church."[20]

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[18]Arrington, pp. 135-7.

[19]Due to the lack of a satisfactory tithing system in Winter Quarters and in the first four years in the Salt Lake Valley, and because of the need for additional revenue to finance the Church's public works and other developmental programs, a special resolution was adopted by the September 1851 general conference requiring each member to pay a tenth of the value of all the assessed property in his possession at that time, whether or not he had previously paid a faithful tithe. See Arrington, p. 134.

[20]Circular to Bishops from Brigham Young, Journal History, July 20, 1854.

Faced with inadequate funds and for reasons of a religious nature the Church in 1854 revived the "higher law" of consecration and those members of the Church desiring to comply with the law filled out the following form and received back a stewardship based on their needs.

> Be it known by these presents that I, _____, of _____, in the County of _____, and the Territory of Utah; for and in consideration for the good will which I have to the Church of Jesus Christ of Latter-day Saints, give and convey unto Brigham Young, Trustee-in-Trust for said Church, his successors in office and assigns, all my claim to, and ownership of the following described property [person lists].[21]

Forty per cent of the seven thousand families then living in the valley transferred their properties to the Church so as to continue the Church's program. Brigham Young consecrated to himself, as Trustee-in-Trust, an estate valued at $199,625.00. To many so far removed from the problems of the Church, this announcement was just a further extension of theocratic despotism, to others the program was un-American and should be stopped and under such heavy criticism the plan was abandoned in 1857 and the Church resorted once again to tithes.[22]

The greatest single tithe was labor tithing, and from the beginning assignments were made weekly to the wards to furnish a quota of men to labor on the public works. In 1863,

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[21]Copies in possession of L.D.S. Historian's Office, Steel File.

[22]Arrington, pp. 146-8.

Daniel H. Wells divided the wards of Salt Lake City into ten districts. It was the intention to keep fifty teams on the road hauling rock from the quarry to the city. Each of the ten districts was to pay its labor tithing punctually on the day assigned, this date to be published in the paper[23] and when the men reported to work they were expected to furnish their own needs and put in a full day of labor. Orson Pratt in conference said:

> We do not want men to come here and say, "Here is a horse," or "I will turn out an ox" or "Brother Wells, I will send a team if you will support it and hire a man to drive it." We do not want any such preferred blessing, but we want them preferred upon the principle that you hire your own board or bring it with you, and bring your horse-feed and maintain yourselves, just as you do at home by your own work, and come and do the labor necessary to be done.[24]

Though the assignments were frequent and strenuous, labor was readily supplied and the responsibility accepted. The Big Cottonwood canal undertaking was assigned in sections to the wards and each section, under the supervision of a bishop, was excavated by the ward members. In October of 1867 a call was made to the brethren of the wards to furnish immediately fifteen hundred loads of rock for the Temple and on November 20, Brigham Young reported that "this call has been responded to with the greatest promptness and cheerfulness.

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[23]Minutes of the 33rd Annual Conference, Journal History, April 6, 1863.

[24]Journal of Discourses, III, April 13, 1856, pp. 350-1.

Teams have come here in great numbers, each teamster bringing his own provisions and the forage for his animals."[25]

A significant factor, in delaying many of the projects undertaken by the Church in this early period, was not labor, but cash shortage. In an attempt to allay this factor gold missions were organized, express companies formulated, government labor contracts for roads and territorial offices readily accepted, and each year the Church sent surplus oxen, horses and mules to California, until eventually all of the Church owned stock was sold. Many items and services needed in the valley were only obtainable on a cash purchase basis and the Perpetual Emigration Fund, the need for machinery and other eastern goods, and the ever-pressing demand for imported goods furnished by the "merchant princes" served only to transfer what available cash there was to interests outside the colony.[26]

Though the Church continually exhorted the people to pay some of their tithing in cash, the largest revenue was "tithing in kind." An itemized record called "Temple Tithing Donations" from the Spanish Fork Ward included:

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[25]Manuscript History of Brigham Young, Nov. 20, 1867, p. 1162.

[26]Arrington, pp. 299-301.

butter	$2.50	labor	$41.65*
beef	3.20	merchandise	2.98
cash	7.75*	oats	2.60
cabbage	.42	wheat	5.40
cheese	2.00		76.31
eggs	.75	sundry items	28.94
flour	7.06	Total	105.25[27]

*[Underlining mine.]

In the year 1868 $143,372.77 were received as tithing in kind. Many of the goods received were not easily transferrable, and the problem of transferring these goods into cash in the 1870's was an extremely difficult one.[28]

Tithing in kind necessitated payment in kind. The tithing receipt issued upon receipt of goods or labor served an exchange capacity and was honored in the tithing storehouses throughout the territory. The tithing receipt carried a cash value, and well might a man laboring in the quarry at Wasatch, send his mother in Logan tithing receipts which she might use in the Bishop's exchange near her home.

In the year 1857 the current wages for craftsmen on the public works were as follows:

trade	per day
carpenters	$2.50 to $3.00
masons	3.00 3.50
machinists	3.00 3.50
blacksmiths	2.50 3.00

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[27]Old Utah Stake Papers, XXIII, Spanish Fork Ward, 1885. Brigham Young University Library, microfilm.

[28]Arrington, pp. 139-40.

painters	3.00	3.50
quarrymen	2.00	3.00
plasterers	(per yd. 20¢ to 25¢, 31¢ for hard finish)	
laborers	1.50	2.00[29]

While speaking in conference, Heber C. Kimball alluded to the payment of public hands:

> I have heard it said that some who work on the Temple at dressing rock, and in the machine and blacksmith shops, have nothing but bread to eat. It seems as though this could not be so; for I have seen the public hands packing home carrots, parsnips, potatoes, etc.; and it is not so very bad while there is plenty of them; and every man gets a pound of flour a day; and I think there should not be any grunting.[30]

In addition to the tithes, many other means were used to gain additional resources for the construction of the Temple. In a letter to Albert Carrington, Brigham Young wrote:

> The various quorums of the Priesthood, Seventies, Priests, Elders, etc., were called upon as quorums, to set good thorough men to work therewith, in quarrying, cutting and laying the rock, and in other labor that would tend the erection of this House of the Lord. The brethren thus employed are to be sustained and paid for by the quorums, through donations by the various members, without touching the tithing, which will be used in paying the freight of rock from the quarry, also in the purchase of iron, steel and other materials, etc., as there shall be need thereof; . . . each quorum of Seventies can on an average send two men, and the balance can certainly be supplied by the High Priests and Elders.[31]

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[29]Brigham Young's Letterbooks, No. 4, 1857-58, p. 367.

[30]Journal of Discourses, V, April 6, 1857, p. 19.

[31]Letter to Albert Carrington, April 15, 1876. Millenial Star, May, 1876, p. 299.

Additional assignments were, as evidenced by ward records, faithfully accepted and executed by the members. On April 17, 1877, the Mount Ogden Ward Elders Quorum promised to pay $100.00 to send Brother M. Reynolds and his wife to Salt Lake City. Reynolds was to represent the ward working on the Temple.[32] The small ward in Salem, while being able to contribute only $96.83 for the Temple fund for the year 1884 reported that "We keep a man constantly engaged in the Temple Quarry--Sometimes his family overdraws, and sometimes we owe them."[33]

The wards were not only expected to sustain their representative while he was laboring for the Church but also his family and after 1877 the wards were expected to furnish directly to the tithing office the cost for boarding a man at the quarry. The price for each man was fifty cents per day, of which the bishops were to pay one third in cash and the rest in any other pay they desired. The wages of the men at the quarry were rated in the tithing office for provisions and one sixth of the pay was in cash.[34]

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[32]Minutes of the Mount Ogden Stake, April 17, 1877, Mount Ogden Stake, p. 221. L.D.S. Historian's Office.

[33]Old Utah Stake Papers, April 14, 1884.

[34]*Ibid.*, Dec. 20, 1877.

In the 1870's with the commencement of the construction of the St. George, Manti, and Logan Temples, the body of the Church was divided into Temple districts. On the 10th of October, 1877, it was decided by the twelve apostles that the cash especially donated by the people for the Temple building fund was to be used solely for the erection of that particular structure being built in the Temple district from which the money came and each district was to build its Temple without calling on any outside wards or stakes. Cash and material needs were to be met by the donations of the people, the only tithing to be used was labor tithing, and any indebtedness was the responsibility of the local agents, nothing was to be charged to the Trustee-in-Trust.[35]

In October Conference of 1874 it was advised that,

> It would be a wise thing for every person in the Church to contribute a monthly donation of half a dollar in money for the Temple, that their names may be put in the book of the Law of the Lord, that old and young among the Latter-day Saints may feel an interest in this matter, that on their fast days they may make the contribution to aid in supplying the necessary means to the workmen that cannot be procured without money.[36]

This fifty cent Temple donation was followed in all the Temple Districts and records of contribution by members

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[35] Letterbooks of John Taylor, October 12, 1877, pp. 68-9. L.D.S. Historian's Office.

[36] Remarks by George A. Smith, Salt Lake City, October 6, 1874. Journal of Discourses, XVII, 197. This would have been a considerable amount as there were well over 100,000 Mormons in the valley at this time. See Arrington, p. 206.

can be found into the late 1880's.[37]

The ladies of the Church were asked to forego their fancy earrings, hair ornaments and jewels; to go to work making shirts for the men on the public works, and to help tend and educate the children. The boys and girls of the wards were encouraged to contribute their nickels for the House of the Lord.[38]

In 1851 the First Presidency called on the saints in the British Isles for an offering to be made annually toward the erection of the Temple in Great Salt Lake City, and named an amount which they considered it was the privilege of the saints of Europe to donate for this purpose. An apportionment was made to the several conferences, and in 1852 the contributions fully met the amount, and several of the conferences had contributed an excess. In 1853 the Saints in England were informed that "from henceforth the living may not expect the blessings of the Temple, unless they build it." They were exhorted to gather up the good things of the earth as fast as they possibly could, to send gold, silver, precious stones and anything else of value which would aid in building the Temple, and to tithe themselves eighteen pence yearly, which alone

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[37]Old Utah Stake Papers, October, 1877 - April, 1881.

[38]Remarks of Heber C. Kimball, Salt Lake City, April 6, 1863. Journal of Discourses, X, 166.

would raise an additional $10,000.00 for the building of the Temple.[39]

As the Temple rose above the foundation, the work became increasingly less the responsibility of the ward laborer and more that of the skilled craftsmen. These men were difficult to find and as work went on they demanded an increasingly larger share of their wages in cash. The daily expenses on the Temple in 1874, excluding freighting and quarrying were $300.00.[40]

The first cash contracts issued by the Church for the Temple construction were to the Sharp brothers for hauling rock from Red Butte to the Temple with terms of $11.00 a cord and operation to commence on May 26, 1853. Their proceeds to October 31, 1854, were $3,199.50. Wages for teamsters ran about $1.50 or $4.00 a wagon load making a total of $1,106.34, which left a tidy profit for the three Sharp brothers and Daniel H. Wells, owners of the company.[41]

In the early 1860's additional contracts were let out to transport the rock from Little Cottonwood Canyon, to construct parts of the canal and to complete the foundation of

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[39] Millenial Star, June, 1853, pp. 200-1.

[40] Deseret News Weekly, May 27, 1874.

[41] Temple Rock Account Book No. 1, May 26, 1853 - Oct. 31, 1854, L.D.S. Historian's Office.

the Temple.[42] Brigham Young was well satisfied with the fulfillment of the agreements by the contractors and was convinced that this was the cheapest and most satisfying method of doing the work.[43]

The plasterers and many of the stonecutters were paid on a "piece work" basis by 1864. Stonecutters were receiving approximately fifty cents a cubic foot for finished work. By way of example, Edward Foster was assigned to cut:

Quantity	Stone	Dimensions	Cubic feet
1	Ashlar	4'9" x 2' x 1'3"	35'10" 6
1	Ashlar	3'1" x 2' x 1'11"	21'9" 10
1	Ashlar	1'5" x 2' x 1'3"	29'6"
2	Stones	1'6" x 2' x 1'3"	29'6"
		Total	100'6" 2

For the above cut stones, Mr. Foster received $50.12. Many other statements of a like nature were found.[44]

In the decade 1870-80 due to the development of home industry and the fulfillment of the concept of self-sufficiency under such influences as the Relief Society, United Orders and Zion's Central Board of Trade a much larger share of the wealth stayed in the valley than had been the case in the previous decade. By the year 1880, the year

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[42] *Supra*, p. 50. Also see Chapter V.

[43] *Millenial Star*, August 31, 1864, p. 718.

[44] Account Book 472, August 3, 1868. L.D.S. Historian's Office.

of jubilee, Church revenues amounted to a little over $1,000,000.00, of which about $540,000.00 was tithing. Of this amount $235,000.00 was expended for the construction of temples.[45]

Economic and Legal Difficulties.--The "Anti-Bigamy Act" of 1862 was only the first of many subsequent bills either introduced or enacted against the polygamous practices of the Church. The constitutionality of these acts, regarding the guarantees of religious freedom, was severely questioned.[46]

Anti-polygamy legislation culminated with the passing of the "Edmunds-Tucker Act" on February 19, 1887. This act, an amendment to the law of 1862, dissolved the corporate charter of the Church, re-affirmed the abolishment of polygamy and provided for the confiscation of all Church properties over $50,000.00 in value. All properties thus forfeited or escheated were to be disposed of by the Secretary of the Interior.[47]

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[45]Arrington, pp. 353-5.

[46]Among the bills considered were the following: "The Wade Bill" of 1866, "Cullom Bill" of 1869, "Ashley Bill" of 1869 and the "Poland Act" of 1874. The "Poland Bill" was the only one which became a law. The constitutionality of this act was tested and upheld by the United States Supreme Court in 1879. Most of these acts served only to strengthen or amend the provisions of the act of 1862. See Arrington, p. 357.

[47]Arrington, pp. 356-61.

In anticipation of the passage of this act the Church transferred a great deal of real and personal property into the hands of trusted leaders. The Saint George, Logan, and Manti Temple Associations were organized in 1886 and the legal matters concerning these structures were to be handled by the local Church authorities. The Granite Quarry at Little Cottonwood was transferred and the title held in private trust.[48]

On September 30, 1887, a law suit was filed in the Supreme Court of the Territory to confiscate all Church properties and it was petitioned that a receiver be appointed to take charge of the assets.[49] Though the Church fought for the receivership under a "vested rights" petition, it was not heard and the court appointed Frank H. Dyer, the United States Marshall for Utah, as the receiver for Church properties. His appointment was made on November 7, 1887.[50]

It was believed that under the provisions of Section thirteen of the Act the Salt Lake Temple would be exempt as a religious building.[51] Nevertheless, the Church properties

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[48] Ibid., pp. 362-65.

[49] Orson F. Whitney, History of Utah (4 vols.; Salt Lake City, Utah: George Q. Cannon & Sons Co., 1898), III, 588-9.

[50] Ibid., p. 599.

[51] This section "Provided, that no building, or the grounds appurtenant thereto, which is held and occupied exclusively for worship of God, or parsonage connected therewith, or burial grounds forfeited." See United States Supplement to the Revised Statutes of the United States, second edition, 1874-91 (Washington, 1891), Ch. 397, pp. 568-74.

were turned over to the receiver upon demand, who in turn upon receipt, rented the properties back to the Church. While some monthly rates were in excess of $500.00 the Temple Block was rented to the Church for $1.00 per month.[52]

On July 11, 1888, the receiver listed the new assets transferred to his care by the Supreme Court. Included in the list was the Temple Block on which no cash value was placed.[53]

The Mormon Church in a petition to the Utah Supreme Court in 1888 sought for confirmation of title for the buildings, properties and assets initially surrendered. All claims were denied in the court's decision of October 8, 1888, with the exception of the Temple Block. The court ordered the release of this edifice to the Presiding Bishops, Preston, Burton, and Winder, as the Trustees, providing that the building be used exclusively for religious purposes.[54] In May of 1890 the Supreme Court of the United States upheld the actions of Congress and of the Utah Supreme Court, and rendered a full decision for the government.[55]

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[52] Ibid., p. 369.

[53] The Temple and Tabernacle Block had been previously evaluated at $150,000.00. See Whitney, III, 594. The actual value of the edifice at this time, at least in terms of expenditures was very close to $2,500,000.00. See Temple Chart in Church Architect's Office, Salt Lake City, Utah.

[54] Deseret Evening News, Oct. 9, 1888.

[55] Arrington, p. 374.

Because of the affirmative stand of the government and the change in the philosophy of the Church on plural marriage, the venerable Wilford Woodruff made an official declaration on September 25, 1890, which reads in part:

> Inasmuch as laws have been enacted by Congress forbidding plural marriage, which laws have been pronounced constitutional by the court of last resort, I hereby declare my intention to submit to those laws, and to use my influence with the members of the Church over which I preside to have them do likewise.[56]

Although sanction of polygamous marriage had officially ended, it was not until June 8, 1895, that all of the properties were turned back to the Church.[57]

With the passage of the Edmunds-Tucker Act, Church income from business and tithing virtually stopped. People were reluctant to turn in anything that might be escheated by the government collector. Church expenses continued unabated and even rose higher during this period. The curtailment of business forced many men out of work, the arrests took the family bread-earner from his labors, and as a result many families became dependent on the Church for their sustenance. Legal fees were high and rents on Church properties became formidable. Interest on notes mushroomed and in less than a year after the passage of the Act the Church was forced to

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[56] Doctrine and Covenants, Official Declaration. Unanimously sustained in L.D.S. Conference, Oct. 6, 1890.

[57] Arrington, p. 378.

borrow $240,700.00 to meet the demands of the receiver.[58]

In the fall of 1887 work on the Temple was stopped and all of the Temple workers were discharged. The Temple Block, as previously mentioned, was returned to the Presiding Bishopric by the Utah Supreme Court in October of 1888 but work, in any appreciable amount, was not commenced again until the spring of 1889.[59]

The total amount expended on construction, as of March 13, 1883, was $1,686,968.41.[60] The remaining months of 1883 saw a tremendous amount of work done on the Temple. At the end of the season in 1884 Harper's New Monthly Magazine reported,

> While for 30 years [the Temple] has been rearing before the eyes of the townspeople, it is a subject of natural curiosity, and one hears many rumors of how many millions supposed to have been expended upon it have really gone into the pockets of a few dignitaries of the Church. . . . I have the words of President Taylor, however, that the total cost has been in round numbers, two millions of dollars, nine-tenths of which is accounted for in cash. It is supposed that three more years time and another million dollars will complete it.[61]

The total payments on the Temple for the years 1853 to 1887 amounted to $2,550,000.00, which would average about

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[58] Deseret News, October 5, 1891.

[59] Whitney, p. 603.

[60] C. R. Savage (comp.), Views of Utah and Tourist Guide (Salt Lake City: by the author, 1887), p. 4.

[61] "Salt Lake and The Temple," Harper's New Monthly Magazine, August, 1884, p. 394.

$75,000.00 yearly. Expenditures were stimulated in the later years and from 1888 through 1890 were $256,146.00.[62]

In the next three years considerable impetus was placed on finishing the Temple. Special days were set aside by the First Presidency for fasting and prayer. During this period large sums of money were collected from Temple offerings. Wilford Woodruff reports in the fall of 1892 that it would take $175,000.00 to finish the Temple exclusive of furnishings. Within thirty minutes $50,000.00 had been subscribed for this purpose.[63]

With the decision to complete the Temple by April 6, 1893, a committee was appointed to make an apportionment to the wards and stakes. John Nuttall was assigned to this committee and reported in his diary that he and four others were appointed to a committee to make an apportionment of $250,000.00 to the several stakes and report to the First Presidency. The report was prepared and a list given to each Church official, who was to take the list out to the stakes and make a call for Temple donations.[64] Evidently the appeal

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[62]Salt Lake Temple Chart (a pictorial chart in the possession of the Church Architect's Office, Salt Lake City, Utah). The Journal of the Trustee-in-Trust lists the expenditures on the Temple Block for this same period of time (1888 - Dec. 20, 1890) as $220,579.70. See this journal under the above dates [no pagination].

[63]Wilford Woodruff, Diary, Vol. XII, October 10, 1892. L.D.S. Historian's Office.

[64]L. John Nuttall, Diary, Vol. IV, October 14-21, 1892, p. 481. Manuscript copy in Brigham Young University Library.

was successful.[65]

An additional $662,972.00 was raised and expended on the Temple from 1890 until its completion on April 6, 1893. The total cost for the construction of the Salt Lake Temple was listed at $3,469,118.00.[66]

The recorded deed for the Salt Lake Temple lists the value of the building at $5,000,000.00.[67]

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[65]Utah Stake which had only donated $669.67 during the year prior to April 6, 1892, donated $2,013.30 at this time for the completion of the Temple. See Old Utah Stake Papers, XXIII, under Salt Lake Temple.

[66]Salt Lake Temple Chart. This figure was reaffirmed by Wilford Woodruff in an answer to a request by the Philadelphia Call in 1894. See Millenial Star, April 4, 1895, p. 223.

[67]For the legal history of the deed and an itemized evaluation of Temple Block see Appendix III.

CHAPTER IV

THE QUARRIES

A matter of great importance in building the Temple was the type of material to be used and its attainability. Thus, the quarries, their tremendous expense, and the enormous amount of skill, labor, and time involved in hewing the stones were major factors in the construction of the Salt Lake Temple.

Selection of Granite.--Soon after the Mormons' arrival in the valley in 1847 a fine bed of red sandstone was discovered a few miles east of the city in Red Butte Canyon. The rock was easily quarried, being a surface deposit, and was used for buildings extensively in the first few years. The decision on whether this material or some other type was wanted in the Temple was brought before the people in the October, 1852 Conference of the Church where the subject of Temple building was a principal theme. Heber C. Kimball said:

> I want a vote from the congregation concerning the Temple, whether we shall have it built of the stone from Red Butte, or of adobies, or timber, or of the best quality of stone that can be found in the mountains. It is now open for discussion. . . . I put the motion which is before you, that we build the Temple of the best material that can be furnished in the mountains of

> North America and that the presidency dictate where the stone and other materials shall be obtained; and that the presidency shall be untrammelled from this time henceforth and forever. I want every brother, sister and child to vote one way or the other. All in favor of this motion raise your right hand. [It was unanimous.][1]

After the motion had been seconded President Young presented some intriguing speculation on the material that should be used in the Temple:

> I am inclined to offer a chemical argument with regard to the material for building a temple in our present circumstances. . . . It has been proposed, that we send to San Pete to get the rock. . . . You may bring the stone from San Pete, which is a beautiful specimen of rock, and erect a temple here with it; then you may take this sand stone, that is found in abundance in Redbute Kanyon [sic], and build a temple of that; then you step over to the Emigration Kanyon, and get this bastard marble, and build another of the same dimensions as that you have built of the red sand stone. . . . Then right beside that, another one of adobes, mixed with pebbles--take that clay and these pebble stones that are so abundant here, and mix in with them straw, and build with different kinds of rock, and let them stand together--which do you think will stand the longer?
>
> Being a chemist in theory, I should say, according to mind, when San Pete rock is washed into the Jordan, the other buildings will still be standing, and be in moderate condition. The red sand stone will go the next, and the other two still remain, the bastard marble or limestone will be pretty good preservation; and when that is all decomposed and washed away into the Jordan, you will find that temple which is built of mud or adobes, as some call them, still remains and in better condition than at the first day it was built. . . .
>
> I do not talk about the expense of the building, and the time it would take to erect it, but the durability, and which is the best material within our reach to build it with. . . . The elements of which the terra firma

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[1]Sermon by Heber C. Kimball, October 9, 1852, Great Salt Lake City. Journal of Discourses, I, 162.

> is composed, are every moment either composing or decomposing. They commence to organize or compose, and continue to grow until they arrive at their zenith of perfection, and then they begin to decompose. When you find a rock that has arrived at its greatest perfection, you may know that the work of decaying has begun. . . . We have proof of this. Go into Egypt, for instance, and you will find the monuments, towers, and pyramids, that were erected in the days of Joseph. . . . They were built of what we call adobies, clay mixed with straw. . . . They have bid defiance to the wear of ages, and they still remain. But you cannot find a stone column that was reared in those times, for they are all decayed.
> . . . . . .
>
> As for the temple, I will give you the nature of your vote with regard to it--the sum of it was, that those that dictate the building of it be left to do with it as they please. They will, anyhow. But I give it as my opinion that adobies are the best article to build it of.[2]

Despite this chemical theorizing, Red Butte sandstone was selected for the Temple and constituted the foundation. By the time of the arrival of the U.S. Army, the granite deposits in the Little Cottonwood Canyon, approximately nineteen miles southeast of Salt Lake City, had been located, samples had been brought in for examination, and it had been decided to build the Temple of this material. James Livingston, who was in charge of the Church quarry, until the last stone was laid in the Temple, reported that "In 1860 I was called to take a few men and start getting granite for the Temple from the mouth of the Little Cottonwood Canyon."[3]

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[2]Sermon by Brigham Young, ibid., pp. 218-20.

[3]Dictated sketch of the life of James C. Livingstone, in the possession of William Kuhre, Sandy, Utah.

Granite is found abundantly in the lower half of the canyon. It is a metamorphic rock deposited on both sides of the mountain in huge striations and large boulders, some of which measure forty to fifty feet in diameter, have fallen from the cliffs above to the sloping hills below. It was from these huge boulders that the rock was hewn out for the Temple, twenty miles away. The granite is a motley looking rock made up generally of three distinct minerals, quartz, feldspar and mica. The feldspar and mica are distributed through the mass as crystal, while the quartz, although clear and glassy has no definite shape. An analysis of the Salt Lake Temple granite in 1882 found it to consist of the following substances:

Substance	Parts in 100
Silica	68.60
Alumina	15.74
Peroxide of Iron	4.01
Lime	3.15
Soda	5.98
Potassia	2.52
Magnesia	.51
Manganous oxide	.12
Total	100.63[4]

Commenting further on the Cottonwood granite, Kingsbury stated:

> The specific gravity was ascertained at the same time to be 2.661. . . . The water inclusions so abundantly found in the feldspar and quartz of most granite, are but meagerly scattered through the minerals of the Cottonwood

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[4]Joseph T. Kingsbury, "Granite Rock," The Contributor, October, 1883, p. 21.

Canyon or Temple Granite. Granite is employed very extensively for building purposes, being considered a very durable rock, capable of resisting for a long time the wear and tear occasioned by rain, frost, wind and other destructive elements. It is true that granite is made up of minerals firmly consolidated, by which it is rendered very durable, yet as the feldspar and mica contain some potassia and soda--substances which are soluble in water, it is bound to succumb sooner or later to the fury of atmospheric agencies. When these two substances are dissolved out of granite, it is left honeycombed, and easily crumbles to the ground. Even before potassia and soda are dissolved, in extremely cold climates granite begins to decay through water penetrating into the soluble parts, and there freezing and cracking it in every direction, and thus destroying the coherent force by which the particles are held together.[5]

Granite and Wasatch.--The small quarry at Little Cottonwood operated intermittently from 1860 to 1870, when James C. Livingston was sent to the quarry to establish a permanent operation.[6] With miners and teamsters flocking into the newly discovered boom town of Alta, the small quarry site, situated in a little hollow at the mouth of the canyon on the north side of the creek, became a town of considerable importance. At the time of its greatest prosperity, from 1872 to 1874, Granite City consisted of about fifty buildings, mostly stores, saloons, boarding houses and cabins and a great many residents were teamsters who hauled the ore from the

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[5]Ibid., pp. 21-22. This analysis is very similar to one which appeared in the Millenial Star, February, 1878, p. 78.

[6]James Livingston's dictated sketch.

mines up the canyon to the smelters which were located nearby.[7] Most of the Church quarrymen lived in Granite City in a small encampment of tents pitched around a center cook-house[8] while the Church teamsters lodged around the Church cattlepens near the Little Cottonwood quarry in small tents resembling Indian wickiups.[9]

Shortly after April 6, 1874, the Church quarrymen moved about one and one half miles further into the canyon to a site where the stones were large and numerous and seemed to be of a higher grade material than those at the mouth of the canyon.[10] The quarrymen followed the route of a newly constructed railroad to its terminus at Fairfield Flat. This narrow-gauge line, subsequently known as the Wasatch and Jordan Valley Railroad was operated under option granted to the Utah Southern Railroad. This span was constructed to the quarry site and later extended to Alta, thus serving both the granite quarry and the mines.[11]

This new site at the terminal of the Wasatch and Jordan Valley Railroad soon became known as Wasatch. An abundance of high quality granite surrounded the community

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[7]Historical Record of the Granite Ward, Mount Jordan Stake, 1893. L.D.S. Historian's Office.

[8]Interview with William Kuhre, March 6, 1959.

[9]Arrington, p. 214.

[10]Deseret News Weekly, April 6, 1874.

[11]See Chapter V.

and all of the remaining rock needed for the Temple was obtained within one mile of this picturesque town. In 1874 the town was officially listed as having thirteen residents, all railroad employees with the exception of R. E. Ballou, who operated a boarding house, and B. C. Harvey, who ran the saloon.[12] The community grew rapidly and in 1883 it was listed as having a population of three hundred and in the line of business, there were three general stores, a hay and grain store, and the saloon which was now under the control of Ballou.[13] Though Wasatch served as a terminal station for the railroad and for the Alta mines, its main service was to the quarrymen.

Most of the men lived in wooden floored tents on the south side of the stream and had erected a temporary bowery for religious services. The most important building on the quarry grounds was the cookhouse which served the men both as a sitting-lounging area and dining room. It also provided office space for the quarry superintendent and sleeping quarters for the cook and any winter workers. Outside and behind the cookhouse was a meat and vegetable cellar and a large range used for baking. Water was brought directly from the creek via a wooden shaped trough, passed by the kitchen and

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[12] J. C. Graham (comp.), Utah Directory and Gazetteer 1879-80 (Salt Lake City, 1874), pp. 203-4.

[13] J. C. Graham (comp.), The Utah Directory for 1883-84 (Salt Lake City, 1884), p. 223.

back into the stream. A little farther north of the cookhouse the railroad and telegraph offices were located. Above the cookhouse, near the stream were the stables which sheltered the horses and mules used on the tramway which ran from Wasatch to Alta.[14]

In the early 1880's many of the Church leaders built summer homes in Wasatch. They planted flower gardens and sent their families there for the summers. In time the old cookhouse was replaced by a small hotel, the footbridge reinforced, and a dancehall was opened for the public.[15] Many comfortable summer homes still dot the landscape, and the interested passerby, pausing for a stroll through the countryside, may discover many vestiges of a work so long ago.

Life and Labor Among the Quarrymen.--Generally the work force at the quarry fluctuated between thirty and forty men and in the early years before the railroad, the quarry was closed for the winter, though between eight and ten men usually remained at the site, the amount of their labor

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[14]Interview with William Kuhre, March 6, 1959. Mr. Kuhre, ninety-seven years old at the time of the interview, has led a remarkable life. He is the only survivor of an Indian massacre against his family. He was raised by the Livingston family and began working in the quarry as an eleven year old boy, first as a cook's assistant and later as a drill carrier. He resides in Sandy, Utah, and serves his Church as a Stake Patriarch.

[15]Kate B. Carter (ed.), Daughters of the Utah Pioneers Lesson Books, March, 1957, p. 399.

depending upon the weather. With the advent of the railroad in the early 1870's the work was expedited. The quarrymen's time book for June of 1887 lists a force of eighty-four men busily engaged quarrying rock for the Temple.[16]

The regular hands labored ten hours daily, six days a week, until the early 1880's when the quarrymen commenced working six eight-hour days. Most of the skilled masons worked in two man teams, though often this was an apprenticeship arrangement. The blacksmiths had a shop down by the creek and a force of three men labored there repairing and sharpening drills and axes.[17]

Most of the common labor was done by men assigned to the quarry from their wards for a period of a week or ten days as a labor tithing assignment.[18] These men generally lived independently from the quarrymen. In a letter to the Deseret News on June 9, 1876, a quarryman wrote:

> The men are not coming as fast as at first expected, for some reason or other. Each man here is credited for what his work is worth. It seems that there is a misunderstanding with some regard as to board as they keep

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[16]Account Book No. 674, June, 1885 - December 31, 1887. L.D.S. Historian's Office.

[17]Interview with Mr. Kuhre.

[18]Each member of the Church was to give one-tenth of his principal when he entered the Church for the upbuilding of the Kingdom. Thereafter, he was to pay one-tenth of his increase, either in property, labor or money. Money was scarce so many men met their obligation by laboring one day in ten for the Public Works. See Chapter III.

> coming here without provision made for it. For the benefit of those who may yet come, I would say, bring your provisions with you, or money to pay for them, as they can be obtained here about as cheap as in Salt Lake City, and though each man boards himself we do it in a consolidated form, we eat what we bring, and have hired our own cook, so no man makes anything from us. There is still another thing I wish to mention--we are very much in need of a roof over our house, as it often rains here.[19]

Many of the hands employed on the quarry were single men from European countries, who were converted to the Church and immigrated to Utah. Having no place to go and being strangers to the language they worked in the Church works, paying off their passage and trying to save enough money to bring over the ones left behind or to get into the farming business. Many of these men later gained important positions and valuable land holdings in the area around the Cottonwoods. Mr. Kuhre recounts a predominance of Scottish, English, Welsh and Scandinavians as making up the crew in the 1870's.

A few of the men had their wives with them, and quite often the wives assisted in the cookhouse. It was reported in 1877 that "three sisters were serving as cooks . . . and were serving delectable dishes."[20]

There was not much variety in the food, but there was always plenty, fresh supplies were delivered weekly, and flour for bread was always sufficient. Beef was brought out in

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[19] Deseret Evening News, June 9, 1876.

[20] Ibid., July 2, 1877.

quarters or halves, fresh mutton was furnished by a herd of sheep which grazed on the surrounding hills, and in the latter years milch cows were kept. Tea and coffee were served morning and night, but most men abstained from these beverages. Pastries and other delicacies were few and highly dependent on the nature of the cook and fruit usually consisted of dried apples, peaches, or apricots. A typical breakfast consisted of three eggs, toast, hot biscuits, chops, potatoes, molasses and fruit.[21]

A regular camp discipline, similar to that which existed in the emigrant trains was employed, with James C. Livingston as superintendent. The work day began with the ringing of the camp bell at 6 o'clock in the morning, at 6:30 breakfast was served and the men reported to their labors at 7:00, lunch was served at noon, and then the men worked from 1:00 to 6:00 P.M. Supper was served at 6:30 and at 7:30 P.M. the men assembled in the bowery for prayer. Alexander Gillespie served as chaplain most of the time and held services every second Sunday in the summer months and twice a week in the winter.[22]

After the day's labors, the men were free to do as they wished, but recreation was limited. Occasional meetings

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[21]Interview with Mr. Kuhre.

[22]History of the Granite Ward, Mount Jordan Stake, 1893, L.D.S. Historian's Office.

were held with mock courts, debates, trials and discussions on current as well as religious subjects. Many of the men were avid readers of newspapers and books. Amusements included checkers, croquet, and cards, but Mr. Kuhre declares that there was never any gaming. A few of the men smoked pipes in the early years, but there was no drinking. Singing was very popular and some of the men travelled into Salt Lake to participate in musical productions. Most of the men went to the valley to spend Sunday with their families, but the others, whose families were too far away, and the single men would walk down to the mouth of the canyon for Sunday School and Sacrament meeting in the Granite Ward. The train did not operate on Sundays and even so the fare was prohibitive, being eighty-five cents each way.[23]

In the winter the snow piled deep and trains and wagons could not get through. Snow slides were common and nearly every winter disaster struck somewhere. In the winter of 1884, thirty quarrymen offered their services to break a trail through the winter snows to Alta to uncover the victims of a snow slide. On the 19th of March eleven bodies were brought to Wasatch; one body was still buried in the slide.[24] Winter time was a time of hard work and conflict with the elements, but even more, it was a time of waiting.

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[23]Interview with Mr. Kuhre.

[24]Deseret News Weekly, March 19, 1884.

Handling the Granite.--At approximately 10 o'clock on June 28, 1877, a group of Salt Lake dignitaries arrived at Wasatch, and after lunch at the cookhouse, rode out in a buggy to watch some of the quarrymen at work. Upon returning to the city one of the members wrote a letter to the News in which he commented on the trip:

> What most attracted our attention was a mammoth size piece of granite. . . . There it stood like a great castle, seemingly bidding defiance to any set of competitors who should undertake to handle it, but the resolute, sturdy hands of the stalwart men said in their hearts it should come down from its lofty height, we witnessed then, and made it turn over on its side [sic]. The following were its dimensions--length 50 feet, breadth 40 feet, and heighth 25 feet. We thought we would try the solidity of it, and found it to contain 50,000 cubic feet. We tried what its heft would be, and found its weight about 3,500,000 pounds or 4,250 tons. We calculated what they intended to do with such a formidable chunk. The answer was to divide it up into pieces of the average weight of 2,500 pounds each and found it could be sliced up into 3,400 pieces. A goodly yield from one stone.[25]

Each layer of stone in the Temple is called a course. The stones in each course were listed on a rock plan sheet which was sent to the quarry. Accompanying the order sheet was a specification chart, which not only included the specifications for a particular stone, but often included scale drawings to illustrate the pattern of the more difficult cuts.

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[25] Deseret Evening News, July 2, 1877. There are several errors in calculation in this statement. The cubic foot computation is correct, but this would weigh 7,400,000 pounds or 3,700 tons. If this were divided into 2,500 pound blocks, this would constitute 2,960 pieces of granite.

Upon receiving the plans from the architect, Superintendent Livingston would usually assign the rough inner course stones to the apprentices and the more difficult cuts and exterior stones to the master workmen. The workmen, usually preferring to work in teams on the larger stones, would select a stone which had the proper grain and begin their labor. When the work was completed the stone was inspected and it was either accepted or rejected on the basis of the cut and the grain of the granite.

The tools of masonry used then had been used for years before and many of them are still used by the monument and stone masons of today. Since most of the fine masonry was done in the shops on Temple Block, only the heavy tools used in shaping the rough stones will be mentioned. To split the large boulders initially into the appropriate size required an eight pound sledgehammer, a stone point drill measuring about sixteen inches long with a 3/8 to 5/8 inch bit, and a sack full of slips and wedges. These slips varied in size but generally were about four inches long and 3/8 of an inch through on the flat side. They were convex in shape, two being placed in each drill hole. The wedge was little longer, starting with a small flat point tapering slowly to a maximum width of 5/8 of an inch.

As the men worked on the boulder, one would swing the sledgehammer, while the other would turn the drill and clean

TOOLS USED BY THE QUARRYMEN

1. Bull set.
2. Eight to 12 pound sledge.
3. Granite axe.
4. Chipping hammer.
5. Facing chisel.
6. Point chisel.
7. Slips and wedges.
8. Single jack-hammer (four pound).
9. Slips and wedges.
10. Stone point drill.
11. Finishing drill.
12. Finishing drill.

Personal photograph taken of the Thomas B. Child tool collection, Salt Lake City.

out the hole. The holes were drilled approximately three and one half inches deep and were spaced from four to seven inches apart. When it was necessary to move from the top of the stone to the square sides wooden scaffolding was used. The scaffolding was set on metal pins, which had been set in the rock, as depicted in the picture.[26]

As the drilling was completed the slips and wedges would be inserted in each hole. The downhill area would be cleared of workmen while one or two men, standing on the base of the block, would proceed to drive the wedges. These men, standing behind the line of break, would tap each wedge in turn along the line of break, until with a sharp retort, the boulder would split. The workmen would repeat the same process on the smaller stone.[27]

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[26]This picture is obviously a posed shot. The quarrymen never worked in such close proximity and please note the hammers. Picture Collection, L.D.S. Historian's Office.

[27]The popularly told account of filling the drill holes with water and saturated wooden pegs, which upon freezing would split the stone is in no way substantiated by factual findings. It may have been tried, as might well have been many other methods. An objective survey of the weather in this area during the quarrying months and the relative short period of time from the receipt of the rock order sheet until its delivery to Temple Block illustrates the poor logic of such a belief. The method explained in the text has been substantiated by publication, picture, and interview.

Mr. Kuhre states that no blasting powder was used to split the rocks during his years, 1872 - July, 1881. As early as 1857 the Deseret News reported on a new mode of blasting, "by which it is represented that rocks may be blasted with much greater facility, than by the ordinary mode," and

SCENES AT THE QUARRY
depicting scaffolds, tools, method and numbers.

L.D.S. Historian's Office.

When the stone was approximately the size indicated on the pattern, it usually became the responsibility of one man to complete it according to specifications. If the stone was to be irregular in shape with long tapered or oblique sides a bull set was used. The bull set was approximately the same size as the sledge and could be used like a chipping wedge to flake off the sides of the stone. For more exacting work it served as a heavy duty chisel, being set and held in position by one man, while being struck with a heavy sledge by another.

Using a single-jack hammer weighing approximately four pounds with about a twelve inch handle and a smaller drill, the quarrymen would split the rock to the exact length needed. Then with a small chipping hammer the stone would be trimmed and the sides trued. The stone was then inspected, and if acceptable was numbered for shipment, and placed in position for the loading crew. In a present day visit to the site one may see many stones in which either the grain turned or a bad cut was made and they were rejected.

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described the method. See Deseret News Weekly, April 22, 1857. James C. Livingston, while working on the Union Pacific Railroad in 1868 had his right hand and part of his arm blown off in a premature explosion at Promotory Point and wore an artificial arm and hook. This may well explain his extreme caution and the lack of the use of explosives in these early years. See Dictated Life of James C. Livingston. It is the general consensus of opinion that low power explosives were used in the latter years. See The Contributor, April, 1895, p. 264, John Nuttall's Diaries, No. 3 (July 3, 1889), p. 28 (Brigham Young University), Interview with L. L. Despain, May 6, 1960, and Interview with Thomas B. Child, June 5, 1959.

With the wide variations in rock size, the diverse terrain and the tremendous weight of the stones, loading before the coming of the railroad was a problem that taxed more than just the strength of men. Log rollers were used for the movement of heavy stones for relatively long distances, while heavy wooden logs and steel bars were used to roll the blocks over or to pry them around. The workmen had developed a wooden two wheeled dolly to transport the smaller stones to the loading station.[28]

A few years before the coming of the railroad Charles Croshaw constructed a derrick to load the granite onto the wagons. For several years hence he was in charge of this operation, loading the last blocks of granite on the wagons and the first ones shipped by railroad.[29] With the advent of the railroad, with its heavy duty cranes and winches, the loading of rock became less and less of a problem.

Thus went life and labor at the quarry, some men spending ten, fifteen, and in the case of James Livingston, thirty-four years hewing granite for the Temple.

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[28]The preceding data was a compilation from the notes taken from interviews with William Kuhre, Thomas B. Child, Stan Johnson and L. L. Despain.

[29]Deseret Evening News, February 12, 1893, p. 13.

CHAPTER V

TRANSPORTATION

The development of a transportational system capable of transporting the huge granite blocks some twenty miles from the quarry to Temple Square is an essential sector of the Temple's history. Little real structural progress was made on the Temple until after 1873 when the railroad was operational. In the meantime a wooden railroad had been constructed and abandoned, a canal completed and likewise abandoned, roads built and a special type of wagon constructed. A successful transportational system was developed only after repeated failures, heroic struggle and a steadfastness of purpose.

Quarry Roads and Wagons.--On January 15, 1850, the General Assembly of the State of Deseret amended the constitution to provide for a State Commissioner of the Public Roads.[1] Two weeks later it was "ordained by the General Assembly of the State of Deseret, that a State Road, eight rods in width, be located from Ogden, the county seat of Weber County, south, passing the Temple Block, in Great Salt Lake City; and

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[1] Deseret News Weekly, January 15, 1850.

terminating at the town of Provo."[2] Branch roads from the state road, and canyon spurs were granted in subsequent legislation.

The first road to be used for the transportation of Temple rock was initially proposed as a railroad. Plans were mentioned as early as February 13, 1851,[3] and on February 22, the City Council issued an ordinance incorporating the Red Butte Railroad Company.[4] This railroad was to be constructed of wood for the express purpose of conveying rock for the Temple. The empty cars were to be pulled to the quarry site east of the city by oxen where they were to be loaded, manned by a brakeman, and coasted back to Temple Square.[5]

Contracts were let for sleepers and rails and construction was started on the last day of April.[6] Throughout the summer work progressed and with the curtailment of labor in the fall, the road had been surveyed, the grading had been partially completed and a considerable share of the timbers

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[2]Ibid., January 28, 1850.

[3]History of Salt Lake Stake, February 13, 1851, L.D.S. Historian's Office.

[4]Minutes of the Salt Lake City Council, Book A., February 22, 1851, L.D.S. Historian's Office.

[5]Interview with John Sharp, February 7, 1959.

[6]History of Salt Lake Stake, April 30, 1851.

and rails were on the ground.[7] With the advent of 1852 contracts were issued for the completion of the work. Then, for reasons not disclosed in available documents, the railroad plan was changed and it was decided, for the present at least, to use broad tire wagons on the road, rather than laying the rails.[8] Work continued gradually and the road was completed for the hauling of rock and lumber by June 17, 1853.[9] This road was used until the late 1860's for hauling the red sandstone foundation blocks.

With the decision to build the Temple with Cottonwood granite an adequate road to the granite quarry became increasingly important. In the late spring of 1860 approximately $1,000.00 in contracts were issued to improve the public road from Salt Lake City to Little Cottonwood.[10] Many attempts had been made at different times by the territorial, county and civil authorities to make a good road, but due to the sandy and porous nature of the soil and the heavy run-off

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[7] Deseret News, September 22, 1851. It is interesting to note that the Deseret News Weekly, May 31, 1851, reported that these rails were floated in on rafts from Archibald Gardner's shop on Mill Creek via the Jordan River.

[8] James Sharp, grandson of John Sharp, claims that a wooden car, loaded with rock, was sent over part of the finished road, but it traveled faster than anticipated and left the track at a little dip in the road. Interview with James Sharp, February 26, 1959.

[9] Deseret News Weekly, June 18, 1853.

[10] Ibid., May 28, 1860.

of the mountain streams, the road was often impassable in the early spring.

The road from Granite City through Fairfield Flat was opened in 1866 by the New York and Utah Prospecting Company, a British controlled firm, which opened the road as far as Central City in 1866 and there built an unsuccessful smelting operation.[11] The discovery of the Emma mine and the other rich strikes made in 1868-69 increased the demand for a good road into the canyon. In 1870 the mining companies of the Alta region raised a subscription of $60,000.00 for the construction of a double track wagon road from Alta to the mouth of the canyon.[12] The following year brought the railroad and the problem of getting rock to the Temple was greatly mitigated.

Quarrying the rock at Red Butte was a relatively simple operation compared with the task of getting the granite from the Cottonwoods to the Temple Block. Due to the many needs of a new country to build, cultivate and develop its resources, the shortage of teams was perennial during this early period. The spring and fall, when transportation conditions were the most advantageous, were the exact times when

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[11] W. Turrentine Jackson, "The Infamous Emma Mine: A British Interest in the Little Cottonwood District, Utah Territory," Utah Historical Quarterly, XXIII (1955), 340.

[12] Salt Lake Tribune, May 20, 1872.

teams were needed for planting or harvesting, or for assisting the Utah immigration.[13] In addition to this the distance from Red Butte to the city had been only three or four miles, the Red Butte rock was lighter and could be transported on lighter wagons, the course of the road was downhill and burdened the animals very little. Most of the quarrymen made two trips daily, spending the night at the quarry, where the oxen fed on the range overnight, leaving for the city in the cool of the morning.[14]

The distance from Salt Lake to the quarry at Little Cottonwood was almost twenty miles and the stones going into the base of the Temple weighed from two to six thousand pounds. The course of the road crossed hills and gulleys, streams and sandpits. The heavy loads required three or four yoke of oxen, the employment of full time teamsters, and four days to make a round trip from the quarry to the Temple Block.

The first contract issued to haul rock from the new quarry was given to John Sharp in the spring of 1860. Under the terms of the agreement he was to haul five hundred cords of granite for the foundation of the Temple.[15] In relation

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[13]In 1863, for example, 384 four yoke wagons, utilizing 3,604 oxen, were sent to Florence, Nebraska to assist the immigrants. During the period from 1861-1868 from two thousand to four thousand oxen were used for this purpose annually. See Arrington, p. 208.

[14]Millenial Star, XVII, No. 32 (August 11, 1855), 507.

[15]Manuscript History of Brigham Young, May 26, 1860, p. 143.

to this contract James Sharp related the following procedures which were used by his grandfather to fulfill the contract. The Sharp brothers had about sixty wagons, which were split into four fifteen wagon sections for the purpose of hauling the granite to the Temple. Since four days were required to make the trip, one unit would be loading at the quarry and one unit would be on its way to town. These wagons would be approximately one mile apart, allowing an hour to a wagon to load. One unit would be unloading at the Temple Block, while the fourth section would be on its way to the quarry. Two small units traveled the route, one doing road maintenance work on the road and bridges, the other helping the teamsters and repairing equipment.[16]

A livestock corral was maintained at Little Cottonwood sufficient to handle three hundred head of stock. In the early years most of these animals belonged to the Church, but some teamsters furnished their own. Hay was furnished by the Public Works and grain by the teamster's ward.[17] Many large wards kept a man fully employed as a teamster for the Temple. In the late 1850's teamsters were paid between four and six dollars a day, depending on how much of the rig was personal property.[18]

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[16]Interview with James Sharp.

[17]Arrington, p. 214.

[18]Temple Account Book, No. 1, 1853-57, L.D.S. Historian's Office.

Though contracts were issued extensively until the advent of the railroad, there was still the annual appeal to towns and wards for men and teams to haul rock for the Temple. In 1861 fifty-seven towns reported that their rock hauling assignments for the Temple had been filled.[19] In the Spring Conference of 1863 Daniel H. Wells asked the people to keep fifty teams busy throughout the coming season hauling rock. They were to send men, not boys. The men were to come fully supplied to sustain themselves and their teams while working.[20] The assignment was generally more specific and forceful than is exemplified in this appeal. In the fall of 1867 the wards in and around Salt Lake were asked to furnish fifteen hundred loads of rock for the Temple. Each Bishop was "required to have ___ loads with from 6000 to 8000 pounds to each load" of granite transported to the Temple. The assignments varied considerably and seemed to be apportioned according to the population and the distance of the ward or community from Salt Lake City. For example, Brigham City was assigned four loads, Tooele County was assigned sixty loads, Brighton was assigned only six, while the Cottonwoods were assigned forty-two loads each.[21]

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[19]Ibid., No. 355, 1861, L.D.S. Historian's Office.

[20]Sermon by D. H. Wells, April 6, 1863. Journal of Discourses, IX, 140.

[21]Letter to Bishops, October 12, 1867. Brigham Young's Letterbooks, p. 423. L.D.S. Historian's Office, Steel File.

In the next few years very little work was done at the quarry as most of the teamsters, like the quarrymen, had accepted labor calls to assist in the construction of the Transcontinental Railroad. With the joining of the rails in May, 1869, the Mormon people decided to build a Utah railroad from Ogden to Salt Lake City. A natural extension of this railroad was constructed from Salt Lake City through Sandy to Utah Valley in 1871-72. Though the quarry had opened up large scale operation again in 1870, the days of the toiling oxen and the harassed teamster were drawing to a close and in the spring of 1872, with the Utah Southern Railroad running trains through Sandy, it was proposed to team the granite downhill to Sandy Station, this being a relatively easy pull of seven miles. On June 20, 1872 the Deseret News reported that,

> The contractors, E. G. Sheets and Isaac Brockbank transported four large cornerstones from the quarry to the Utah Southern Railroad Company, near Sandy Station, Utah. These four blocks weighed respectively 9,173; 9,093; 8,680; and 8,380 pounds when they were brought on to the Temple Square. Thirty-two additional rocks of this type were awaiting transportation.[22]

The loading and transporting of such a taxing burden with any degree of success evidently was a matter of trial and error. While quarrying rock at Red Butte, Brigham Young had tried hauling the heavy foundation stones with both horse and mule teams. At the time of the venture doubt was expressed

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[22] Deseret News Weekly, June 20, 1872.

as to the possibility of such a combination.[23] Though many small loads were brought by horse team and wagon, it was the resolute, plodding oxen which hauled the huge blocks to reconstruct the foundation.

The possibility of injurying a team and breaking an expensive wagon acted as a deterrent on the part of Church members to furnish their own rigs for the transportation of rock and in order to get teams and wagons the Church found it necessary to repair and replace all broken equipment. On repeated occasions the Church appealed to the teamsters that the cost of repairing wagons was burdensome, and exhorted them to be careful with the management of their teams to avoid the unnecessary breakage of wagons.[24] Wagons especially rigged for the transportation of rock were being utilized by the Church at least as early as the spring of 1857.

With the granting of the contract to the Sharp brothers to haul granite from the Cottonwood quarry to the city, a rather unique wagon is reported to have been developed. An "old timer" who worked as a water boy for the Sharp brothers when they received the rock contract in 1860, when asked about the type of wagons used responded,

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[23]Remarks made by Brigham Young, Bowery, June 7, 1857, Journal of Discourses, IV, 350-1.

[24]Sermon by Daniel H. Wells, Bowery, April 6, 1863. Ibid., IX, 140.

> You see, we used to load the smaller stones on wagons, but the big ones we hung under them. We'd been having a terrible time. The rocks were heavier than most men thought, and many a wagon broke down. Then one day a brother of Bishop Sharp drove up there with a whole string of heavy freight wagons. Some three and three-quarter Schetler and some high-wheeled government ones. On those high-wheeled wagons they put two long red pine logs and chained them to the front and back bolsters. Then when the men had a rock ready the loaders would put some red pine rollers, about six inches through and five feet long, under this rock, and with smaller poles as levers, they would roll it to where the wagons could be loaded. They would get a wagon astraddle this rock, dig some holes for the wheels, and sink it till the top of the rock touched the bottom of the logs. Then they would chain it in place and when the oxen started, the poles under the rock would roll a little, and as soon as the wheel is got out [sic] of those holes the rock was swinging free under the logs.[25]

When questioned on the type of wagon used, James Sharp said, "Brigham Young had been having trouble getting the large rocks out, and many of them were strewn along the road, whereon he asked the Sharp brothers to help him get a wagon to haul his rock." He then described the type of wagon developed; it was much the same as the one just described.[26]

The wagons generally used were broad tired freight wagons. Many wagons of this type were brought into the valley by the U.S. Government's supply trains. Many others were

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[25]"Temple Recollections," The Improvement Era, XLIII (April, 1943), 228.

[26]Interview, March 7, 1959. If this type of wagon was used, it was discontinued before Mr. Kuhre moved there in 1872. Though many of those interviewed placed credence in the story, others regarded the story as a fable. No conclusive contemporary evidence was found.

Loading the wagon-
depicting the loading pit and a rock dolly

Three yoke ox team with a load of granite

brought in by small freighting companies, who not only sold their cargo, but their wagons as well. This type of wagon, stripped of its sideboards and bolstered with heavy timbers, would serve the granite teamster well.

Upon arriving at the quarry the wagon was pulled down an embankment into a trench. The trench was deep enough so that the bed of the wagon was level with the ground. With the wagon bed flush against the dirt embankment the loading crew would slide the stone onto the wagon. With the stone centered and secured, the teams would then pull the wagon up the incline and start the long trek to town.[27] Though discouragements arose and seemingly insurmountable obstacles had to be overcome, the entire Temple foundation was laid with stone brought by team and wagon.

Proposed Canals.--In order to allay the high cost of transportation and to ease the exhausting labor on man and beast, a waterway to the quarries was proposed. Canal building was not new to these people as many of them had migrated from the New England states during a period of extensive canal building and were familiar with its potential.

As early as October 28, 1849, there was discussion on bringing the waters of the River Jordan and the Little Cottonwood Canal into the city for irrigation purposes.[28] The

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[27]Interview with William Kuhre.

[28]History of Salt Lake Stake, October 28, 1849.

Stansbury map of 1849 depicts a canal running from the direction of the Cottonwoods toward Salt Lake City. This proposed canal measured a little over six miles in length. In January of 1850, $2,000.00 was appropriated to construct a canal from the channels of Big Cottonwood, Mill, and Little Kanyon Creeks for irrigation and other purposes.[29] This canal was surveyed and ready for labor on May 1, 1852.[30]

No further mention was made of canal building until February 1, 1855, when the Legislative Assembly granted to

> Brigham Young, Isaac Chase and Feramorz Little, and their associates and successors the right to make a canal from Big Cottonwood to Great Salt Lake City and a strip of land one mile wide on the East and a half mile on the West side of the canal for its entire length.[31]

This permanent canal was to be constructed to boat granite rock from the Big Cottonwood for the Temple construction and the general building up of the city with any surplus water to be used for irrigation. It was hoped to have the canal in readiness for boating rock by June, 1856, and in order to promote the work it was proposed to let out contracts

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[29]Amendments to the constitution of the State of Deseret. An Ordinance, For Taking Out the Big Cottonwood, and Other Creeks, For Irrigating and Other Purposes. Passed by the General Assembly, January 15, 1850, Sec. 1, Legal Pamphlet File, L.D.S. Historian's Office.

[30]Deseret News Weekly, May 1, 1852.

[31]Deseret News Weekly, February 1, 1855. The extent of the land grant is unknown.

for labor payable in land along the route and credit it to tithing.[32]

David Wilkin was appointed superintendent and the survey was begun. Faced with an extremely dry season, and the possibility of continued drought, work was pushed forward with vigor. Due to the failure of grass for the teams hauling from the quarry, teamsters, quarrymen and hands from the public works abandoned their skills to work on the canal. By the end of August several sections of the canal were nearing completion; work was progressing rapidly and all of the heavy fills north of Big Kanyon Creek had been let out by contract.[33]

These contracts were mostly given to men on the public works and were on a competitive bid basis. The bid was on a cash basis, rather than the flour and grain script[34] currently being issued by the public works. Two bids for a fill in Red Butte Canyon measuring sixty feet in height and one hundred and seventy-six feet in length for $1,700 and $1,900 are typical of the expense and labor of this undertaking.[35]

Labor tithing was employed extensively and each of the wards was assigned a section of the canal to complete.

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[32] Ibid.

[33] Ibid., August 29, 1855.

[34] Due to the continual shortage of cash the public works often paid only a small percentage of wages in cash and the rest of the wage in script redeemable for foods.

[35] Letters to John Sharp, July 31, 1855. L.D.S. Historian's Office, Steel File, under Jordan Irrigation Co.

The records of the wards for this period of time indicate that the wards were supplying men six days a week. The average ward member spent between one half and two days weekly fulfilling the assigmments made by the bishop. The bishop was foreman of his assigned section and spent a large part of the week on the job.[36]

Water was turned into the canal for irrigation purposes on June 13, 1856, from Big Cottonwood to Kanyon Creek and was being used for irrigation of the five- and ten-acre lots.[37] Labor was continued into 1857 and when Brigham Young visited the head of the Big Canal on March 17, he was pleased with the great amount of work done and expressed a desire that work be continued until the canal was in condition to boat rock for the Temple.[38] Work proceeded on the canal until at least March 6, 1858, when the Sixteenth Ward, which had been furnishing workmen since the 2nd of February, 1856, recorded their last labor tithing entry for workers on the Big Cottonwood Canal.[39] The advent of the U.S. Army in 1858 led to the closing of the public works. Official word of the abandonment

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[36]Salt Lake Stake Record of Members to 1940, February 2, 1858, pp. 200-209. L.D.S. Historian's Office.

[37]History of Salt Lake Stake, June 12, 1856.

[38]Deseret News Weekly, March 17, 1857.

[39]Membership Records of the Sixteenth Ward to 1904, L.D.S. Historian's Office.

of the huge project did not come until March 2, 1862, when Brigham Young announced,

> The canal that we started from Big Cottonwood Creek to this city was for the purpose of transporting material for building the Temple. . . . We have learned some things in relation to the nature of the soil in which the bed of the canal is made that we did not know before. We pretty much completed that canal, or, in other words, we hewed out the cistern, but, behold, it would not hold water. We have not the time now to make that canal carry water, so we will continue to haul rock with cattle, and when an opportunity presents, we will finish the canal.[40]

This canal as reported in the Deseret News was four feet deep and twenty feet wide at the bottom,[41] growing gradually wider as it neared the top, depending upon the nature of the soil through which it passed. It was of ample size and

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[40] Journal of Discourses, IX, 240. The Deseret News in an article on this canal quoted W. C. A. Smoot, who had worked on the Canal, regarding its abandonment. "When the water was turned into the canal it was noticed that when it reached the point on the side of the mountain round which it passed Parley's Canyon, the soil was of such a nature that the fluid sank nearly as rapidly as it entered. The bed of the ditch was of loam, and the water percolated through it as if it had been a sieve. Either the builders of the canal did not have the time, or did not think of the plan of fluming the ditch over this stretch of porous soil. At any rate, it was not done, and the water seeping down as it did in quantity from the hillside, threatened with destruction the newly established woolen mill a short distance below. . . . And the annihilation of this promising plant was one not to be considered by the leaders of the people." See Deseret News, December 18, 1909, p. 13.

[41] The two bid sheets for the fill over Red Butte Kanyon are itemized, though the specifications differ, each provides for an embankment fifteen feet wide at the top. See Letters to John Sharp, L.D.S. Historian's Office, Steel File, under Jordan Irrigation Company. Note: This fill was near the terminus of the canal and may well have been narrower. Cost also may have been a factor in narrowing the width over such wide fills.

capacity for the purpose of its design.[42]

Bisecting the rolling benchland as it did and terminating in the eastern part of the city, the canal passed over ravines and through hillsides. Terrain of such a pattern provided tremendous difficulties and necessitated the construction of many cuts and fills. In areas where the obstruction was of such huge depth and width to render the making of a fill or cut impractical, the canal would have to circumvent the obstacle. For example, if the canal, which was headed north, approached a deep ravine, which opened toward the west on the downhill side, the canal upon approaching the brink of the ravine would turn into the ravine on the north hillside (eastern end) toward its origin. The canal would gradually flow in this direction until striking the stream bottom, then forming a "V", it would switch back on the side of the hill until breaking the brink of the gully; it would then pursue its original course. To circumvent a high plateau, the same pattern would be followed, only the detour would be to the west.[43]

The soil along the canal varies considerably and in some places, as described, it is porous and coarse grained

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[42] Deseret News, December 18, 1909, p. 12.

[43] Interview with John Castro, April 23, 1959. A study of the township maps for 1869 depicts this irregular pattern. It was further substantiated by visits to the site of the old bed in Holladay Hills.

while other areas are full of rocks and so it must have constituted a great deal of labor to excavate such a sizeable canal bed. Some light is shed on the method of construction by W. C. A. Smoot, who worked on the canal.

> The digging proceeded under difficulties. We had only oxen in the way of teams; there were very few horses in those days. We had some plows, but no scrapers at all. Some of the men had shovels; but the majority of the workers had only the ordinary garden spade, and with these implements the old canal was constructed. It was a slow process taking out the dirt plowed up with spades.[44]

As to the final state of completion, the canal was actually constructed from beyond the mouth of the Big Cottonwood on the south, to a point on the flat east of the old tower in the northeastern part of the city; and the water was turned into its length two or three times but as far as the best recollection of those who took part in building the remarkable waterway extension, no boat was ever laden with stone for transportation from the mountain to Salt Lake City.[45]

Thus, after two years of labor, this gigantic project, which the Salt Lake Tribune said had cost the Church members

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[44] Deseret News, December 18, 1909.

[45] Ibid. The bid sheets on the Red Butte fill are northeast of the tower mentioned. The bids were submitted on July 31, 1855. Some sections of the canal were evidently completed long before others, as work was going on at the Big Cottonwood portion as late as March 17, 1857. See News of this date.

$169,000.00[46] was abandoned, and though sections were later used for irrigation purposes, time and the plow have erased almost every vestige of its course.[47]

Such a staggering loss was looked upon as only a temporary set-back by the undaunted pioneers. On August 12, 1864, a mass meeting was held in Salt Lake City

> for the purpose of taking into consideration the feasibility of bringing out a portion of the River Jordan and by cutting a canal at or near the point of the mountain, hence in a northeasterly direction to form a junction with the Big Cottonwood Canal . . . for $171,000.00.[48]

The survey proceeded immediately and on November 2, 1864 was completed, the means subscribed and work was ready to commence.[49] Two weeks later, in a letter to Daniel H. Wells, Brigham Young clarified one of the purposes for the canal.

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[46]Some lost far more than their money. Robert Gardner wrote in his diary, "I was using the water of Mill Creek to run my farm and pasture, and about 1856, it was taken out of my place by other appropriation and it left my place dry. I was counseled to finish a canal which was partly constructed to Big Cottonwood . . . to get water to run my mill and irrigate my farm in place of the Mill Creek water. In this undertaking I turned over my horses and stock to buy lumber and pay for work digging the canal and making the flumes, until all my stock was gone excepting two yoke of young steers. . . . It [the canal] proved a failure. This caused me to lose all my crop, and my mill would not run and I had paid out all of my stock and become [sic] flat broke financially. I was to go on a mission the following spring. See Journal and Diary of Robert Gardner, Daughters of Utah Pioneers Lesson Book, March, 1949, p. 287.

[47]Salt Lake Tribune, July 9, 1874.

[48]Deseret News Weekly, August 24, 1864.

[49]Ibid., November 2, 1864.

He wrote, "The first portion of the canal will be immediately pushed from Little Cottonwood to the city, and it will be used for navigation purposes, especially for the Temple."[50]

On November 26, 1864, another public meeting was held, at which three separate canals were proposed. The smallest proposed canal was to be twelve feet at the bottom and to cost $287,088.00, the second proposed canal was to be sixteen feet wide and to cost $387,952.00, while the largest canal proposed was to measure twenty feet wide at the bottom and was to cost an estimated $485,500.88. It was decided that the wisest move would be to construct the twelve foot canal immediately and to widen it as was needed. Brigham Young, acting as Trustee-in-Trust, offered the company $50,000.00 for the privilege of boating rock on the canal for the Temple.[51] The remainder of the expense was to be carried by the inhabitants of Salt Lake County east of the Jordan River through taxes and water shares. The company was incorporated at a $1,000,000 maximum.[52]

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[50]Letter to Daniel H. Wells, Great Salt Lake City, Utah, November 18, 1864. Brigham Young's Letterbooks, No. 7, p. 354.

[51]The imperativeness of the canal is evidenced by Brigham Young's appeal to the merchants of the city to lend the Church the $50,000.00 so work could start immediately. See Brigham Young's Letterbooks, January 7, 1865, p. 425.

[52]Deseret News Weekly, No. 30, 1864.

Dimensions of Canal				Area of Cross Section of Water	Velocity of Current Per Hour in Miles and Feet	Amount of Water Discharged Per 24 Hours after Deducting one-half for Evaporation, Waste, etc.	Square feet of Ground which One Cubic Foot of Water will irrigate
Length in Miles	Breadth on Bottom	Depth of Water	Inclination Per Mile				
32	12 Feet	3 Feet	20 Inches	45 Feet	1 5/8-300 Ft.	4,795,200	24
32	16 Feet	3 Feet	20 Inches	57 Feet	1 3/8-540 Ft.	6,238,080	24
32	20 Feet	3 Feet	20 Inches	60 Feet	1 3/4-800 Ft.	7,775,240	24

Number of Acres which can be Irrigated		Cubic Yards of Excavation Per mile				Average Cost of Excavation Per Mile	Total Cost of Excavation	Estimated Amount For Dams, Flumes, Bridges Etc.	Total Cost of Canal
Per Day	Per Week	Which can be Thrown	Cost Per Yard	Which has To be Wheeled	Cost Per Yard				
							217,107.20		287,107.20
2642	18,494	4,480	40cents	8,820.00	60 cents	6784.60	217,088.00	70,000.00	287,088.00
3437	24,059	4,588.8	40cents	18,500.80	60 cents	9936.00	317,952.00	70,000.00	387,952.00
							415,580.16		485,580.16
4283	29,981	4,588.8	40cents	18,585.60	60 cents	12,986.88	445,580.00	70,000.00	485,580.88

Deseret News, Nov. 30, 1864

Evidently, in the few months following the initial motion made on November 26, 1864, the citizens of the Cottonwood wards were not too willing either to share their water or to pay the assessment for the construction of the new canal. So much dissent and indefiniteness led Governor Charles Durkee to veto the canal bill in January, 1865. In a letter to George Albert Smith, President of the Council, he expressed his reasons. The Governor feared that the perpetual right of succession would lead to poor management and monopolistic control. He believed that such a bold and imaginative project should be more carefully engineered as to its dimensions, costs, rates, guarantees and its date of completion. Fearing that the canal would not serve the best interests of all of the people in the valley he felt obliged to act as he did.[53]

So many large plans with such insignificant results led to the passage in 1865 of the irrigation district law entitled, "An Act To Incorporate Irrigation Companies," which was passed on January 20, 1865, and placed the legality for the incorporation of an irrigation company under the jurisdiction of the county court.[54]

Shortly after the passage of this act, on February 4, 1865, the Deseret Irrigation and Navigation Canal Company

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[53]Letter from Charles Durkee to George Albert Smith, January 15, 1865. Utah State Historical Society, Steel Kitchen Safe, under Legislature.

[54]Report of Irrigation Investigations in Utah (Washington: Government Printing Office, 1909), pp. 40-1.

was organized. This canal was to be 32 1/4 miles in length and was to be 20 feet wide at the bottom, with a 45 degree bank. It was to be excavated so as to draw 3 feet of water, with a maximum carrying capacity of 4 feet, the fall to be 20 inches to the mile. A heavy substantial dam was to be built with flumes and gates to control the water. The canal was to have 10 locks, constructed of planks and timbers, 14 feet wide, narrowing to 12 feet at the gates. The total length of the locks was to be 75 feet with an interior clearance of 45 feet; each lock being 10 to 14 feet deep. The 12 1/4[55] miles of the canal from Salt Lake City to the Little Cottonwood was to cost $110,000.00; the total cost including the dam, locks, waste weirs, sluice ways, and the flumes was estimated to be $403,000.00.[56] It was planned to boat 4,000 tons of granite yearly over this canal. This would be a distance of twelve miles and would cost $20,000.00 per year resulting in a savings of $10,000.00 a year for the Church.[57]

The company proposed to finance the undertaking by selling 3,000 of the 24,760 acres of land made arable by the

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[55]This canal was also to have included a towpath along the bank, so that horses and mules could pull the heavily laden scow from the quarry terminal to the city. The slow fall of 20 inches to a mile would allow the scow to be easily pulled back upstream. See Deseret News, December 18, 1909.

[56]Deseret News Weekly, February 15, 1865.

[57]Ibid., November 30, 1864.

new canal for $10.00 an acre and levying a tax on city and rural lots which would benefit from the water. The total cost to the inhabitants east of the river was to be $365,500.00. Twenty-five per cent was to be paid immediately so as to finish the canal from Little Cottonwood to the city for the transport of the granite.[58]

The next three years were railroad building years and little, if any, work was done on the canal. The plan, however, was not abandoned for on January 5, 1870, it was reported that progress was being made on the Deseret Irrigation and Navigation Canal and by spring it was hoped that the canal would be ready for boating rock to the Temple.[59] Work continued throughout the spring and on May 18, 1870, the News further reported that the directors of the canal planned on turning water into the Cottonwood excavation on May 18 and that they would report future developments.[60] It appears that the News never heard.

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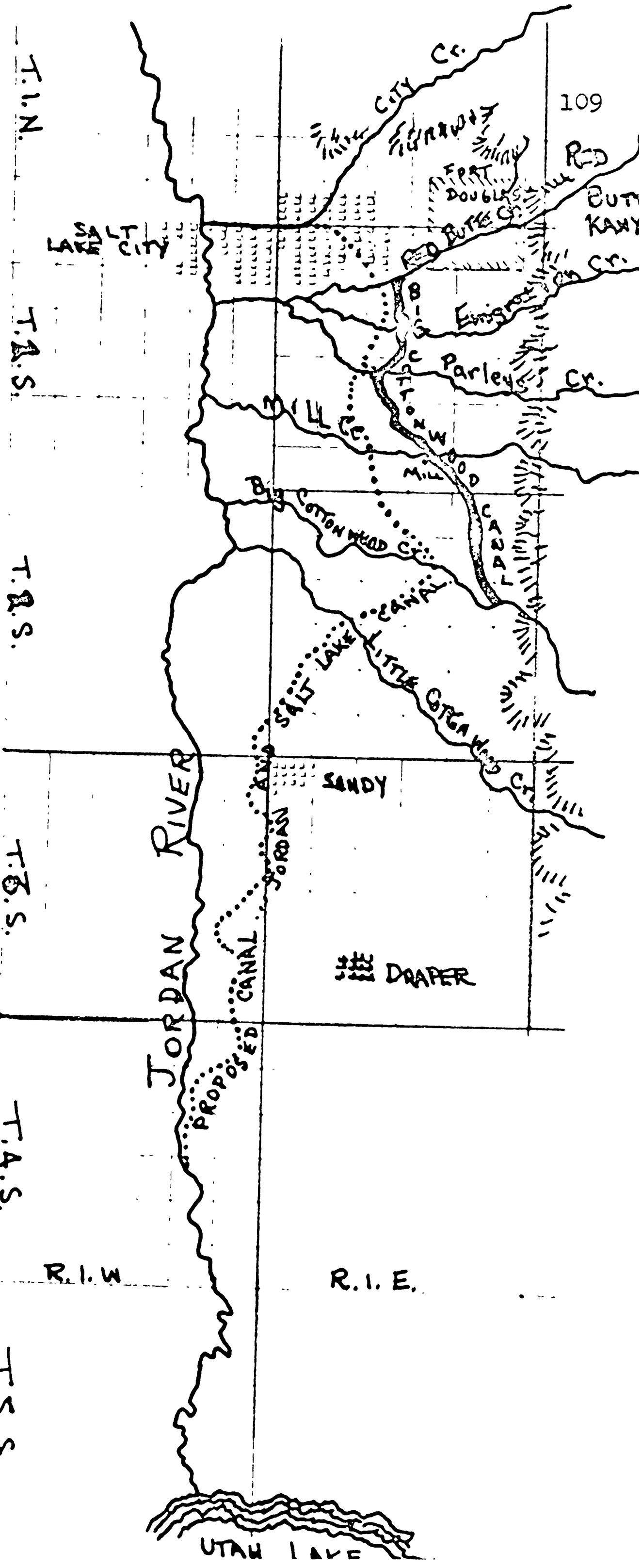
[58] Ibid.

[59] Ibid., January 5, 1870.

[60] Ibid., May 18, 1870. In 1879-82 the Jordan and Salt Lake City Canal was constructed. It is interesting to note that the waters of this canal flowed through a part of the old Cottonwood Canal that had been dug years before for the purpose of boating granite blocks to the Temple. See Fisher Sanford Harris, 100 Years of Water Development, Report to the Board of Directors, The Metropolitan Water District, the Board of Commissioners and the Citizens of Salt Lake City, April, 1942.



JORDAN RIVER
and
BIG COTTONWOOD CANAL
also
PROPOSED CANAL - JORDAN
and SALT LAKE.

Within the year a right-of-way was granted to the Utah Southern Railroad to construct a line south to Payson. Included in the right-of-way bill was a proposed spur from the Utah Southern track to the Little Cottonwood Canyon. With the coming of the railroad, as had been the story in the East, the canal building era came to a close.

The Wasatch and Jordan Valley Railroad.--The necessity of the railroad in order to carry on the many activities in the new territory and to complete the Salt Lake Temple was often noted by Church leaders. President Young repeatedly emphasized that the railroad must be completed before much work could be done on the Temple[61] and, also, the abandonment of Public Works projects in order to assist in the construction of the transcontinental illustrates the relative importance the Church assigned to this undertaking.

One week after the Golden Spike ceremony, the Utah Central Railroad was incorporated under the laws of the territory. It was begun on May 17, 1869, at Ogden and was completed to Salt Lake City on January 10, 1870.[62] As early as February 15, 1871, a natural extension of this line, known as the Utah Southern, was incorporated

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[61]H. W. Naisbitt, "Temple Building," The Contributor, XIII (April, 1892), 253.

[62]Milton R. Hunter, Utah, The Story of Her People (Salt Lake City: Deseret News Press, 1946), p. 196.

> for the construction of a railroad and telegraph from the city of Salt Lake, in the Territory of Utah, to Payson city, in said territory, together with a branch road from the most eligible point on said railroad to the mouths of the Big and Little Cottonwood Canyon.[63]

Ground breaking ceremonies commenced on May 1, 1871, and by August 2, the first twenty miles were graded. It was the intention to lay one mile of track per day,[64] but due to the difficulty encountered in obtaining rail the track was not completed to Sandy until September 23, 1871.[65]

The Utah Southern, which had the right of way for a railway spur into the Cottonwood area, had concentrated its efforts on moving southward and had only graded a small portion of its branch line to the Little Cottonwood Canyon. To expedite the construction of a railroad into the booming mines of the Alta region and very possibly to forestall action by outside interests[66] the Wasatch and Jordan Valley Railroad

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[63] Deseret News Weekly, March 1, 1871.

[64] Ibid., August 2, 1871.

[65] Andrew Jenson (comp.), Encyclopedic History of the Church (Salt Lake City, Utah: Deseret News Press, 1941), p. 907.

[66] The Tribune on June 4, 1871, reported that a group of Philadelphia capitalists had been organized for the purpose of constructing a single or double narrow gauge railroad from Sandy Station to Alta. The company sought the same grant as held by the Union Pacific, which might have meant control of approximately one hundred square miles of land in the valuable Cottonwood area, and possibly the Church quarry. See Journal History, February 15, 1873. A two year struggle ensued between the Utah corporation and the Philadelphia interests in both the U.S. Senate and House of Representatives for right

Company was incorporated under the laws of Utah on October 14, 1872. This road was to be a three foot narrow gauge with a capital stock of $500,000.00. The larger portion of the stock was held by the Cottonwood mining companies and the road was to operate between Sandy and Alta.[67]

The three and one-half miles of bed graded by the Utah Southern were secured, and at the terminus of this bed, about half way between Granite and Sandy, the groundbreaking ceremonies were conducted on November 4, 1872. Enough iron was ordered to complete the road and it was hoped to have trains operating on part of the line by December 25.[68] The grading was nearly completed and the ties were on the ground when the rail finally arrived on January 6.[69]

On April 4, 1873, Brigham Young travelled by train to the quarry on a flat car to celebrate bringing the first granite to the Temple by train. On the return trip was the first granite stone shipped for the Temple, an arch stone

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of way privileges. A general act passed by Congress on March 3, 1875 granted to all railroad right of ways then pending federal sanction if the corporations had complied with state or territorial regulations. See U.S. Statutes at Large, XVIII, Part 3, p. 482. By this act the Wasatch and Jordan Valley received right of way under the Utah Territorial legislature. Interview with Robert W. Edwards, August 12, 1960.

[67] Salt Lake Tribune, January 6, 1873.

[68] Deseret News Weekly, November 18, 1872.

[69] Salt Lake Tribune, January 6, 1873.

5 1/2 feet long, 3 feet wide and 2 feet thick, weighing approximately 7,500 pounds. The train left the quarry at 4:00 P.M. and, after trans-shipment at Sandy, arrived in Salt Lake City at 5:15 P.M.[70]

The company at this time had one locomotive, one mail and baggage car and ten flats. They were awaiting shipment of an additional engine, which was especially designed to climb the steep grades of the mountainous railroad.[71]

The railroad was completed to Granite City on May 3, 1873. As the railroad construction proceeded up into the canyon, its course became very irregular. It was constructed on the north side of the creek, well above the canyon narrows, in order to benefit from the sun's rays on the winter snows. The uphill gradient of the road was steep and necessitated the construction of several switchbacks, just before entering the terminal at Fairfield Flat. The road was completed to this terminus on September 18, 1873, and work terminated there for the season, it being the intention of the company to construct

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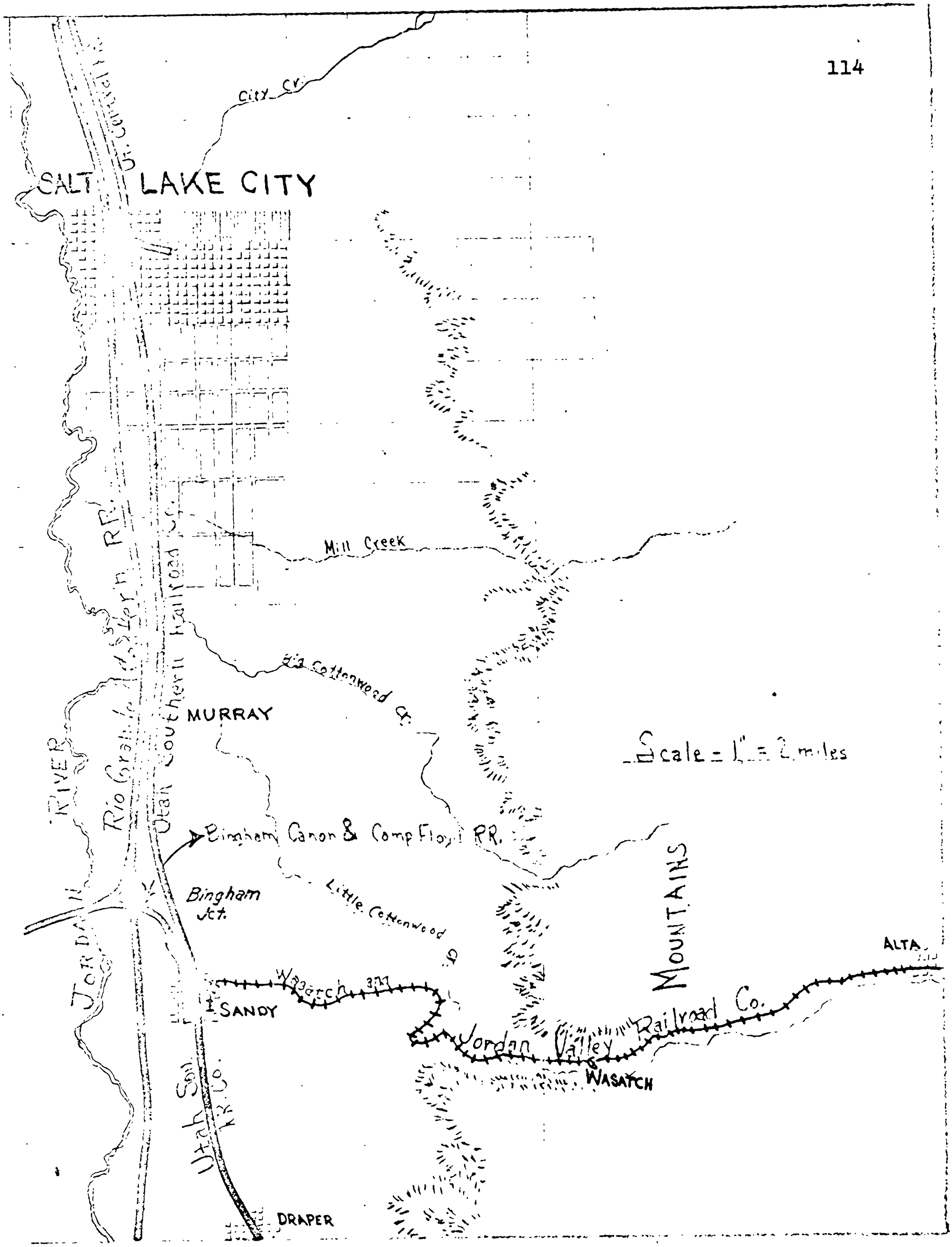
[70] Deseret News Weekly, April 16, 1873.

[71] Ibid., November 18, 1872. A steam engine, developed by John W. Young, had been experimented with extensively in August of 1872 for the purpose of hauling rock from the Cottonwood quarry to the Sandy Station. However, the road was so rough, porous and sandy that the machine was unsuccessful. It had sufficient power, but when heavily laden it would plow itself into the sand until it became immobile. See Salt Lake Tribune, August 10, 1872.


City Cr.
SALT LAKE CITY
Mill Creek
Big Cottonwood Cr.
MURRAY
Scale = 1" = 2 miles
Bingham Canon & Camp Floyd RR.
Bingham Jct.
Little Cottonwood Cr.
MOUNTAINS
ALTA
Wasatch
SANDY
Jordan Valley Railroad Co.
WASATCH
DRAPER

the line to Alta in the spring.[72] The company at this time had constructed eleven and one-third miles of railroad and their rolling stock consisted of three locomotives, fifty flat cars, one baggage and two passenger cars. Business was brisk and they had two passenger trains going each way every day and sometimes four or five freight trains.[73]

In the first year of operation 8,706,000 pounds of granite were shipped to Sandy and then trans-shipped over the Utah Southern to Salt Lake City.[74] From August 27, 1873, until July 23, 1881, the Church was being charged $9.00 a car for shipment from the quarry to the Utah Central Depot in Salt Lake City. The car capacity was listed at 20,000 pounds and a system of penalties seemed to exist for overweight loads.[75] The shipping charge was subsequently lowered to $8.00 a car after July 23, 1881,[76] and was stabilized near this figure.

Train loads generally ran about 60,000 pounds each day or every other day, though wide variances were noted.

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[72]Kate B. Carter (ed.), "The Story of Utah's Canyons," Treasures of Pioneer History (Salt Lake City: Daughters of Utah Pioneers, 1957), VI, 397-8.

[73]Edward L. Sloan (comp.), Gazetteer of Utah and Salt Lake City Directory 1874 (Salt Lake City: Salt Lake Herald Publishing Company, 1875), p. 47.

[74]Ibid., p. 45.

[75]Church Invoices, 1872-76, L.D.S. Historian's Office.

[76]Voucher Book, 1881, L.D.S. Historian's Office.

The train did not operate on Sunday. Sometimes, two or three days would pass between shipments and then six carloads would be shipped followed by a two or three carload shipment the next day. For example, on July 15, 1876, two train loads of granite were shipped to Temple Block. One load was for 97,000 pounds and the other for 100,400 pounds. There was no further entry until July 19, 1876, when a shipment for 130,130 pounds of granite left the quarry.[77]

The train schedule in 1873, for freight going to Salt Lake City from Sandy Station, provided for two trains daily, one leaving at 9:55 A.M. and an afternoon train at 4:45 P.M.[78]

There was no turntable at Wasatch and any switching or spotting of cars had to be done by the utilization of sidings. The empty cars were pulled up from Sandy to Wasatch. In order to "spot" the cars near the granite loading station, the spur switch was thrown and the engine would back the cars down the canyon, but at the same time making a steady ascent on the northern side of the canyon. The cars would then be uncoupled and braked, while the engine would steam back to the main line. The switch would be thrown and the cars would

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[77]Account Book Nos. 199, 355, L.D.S. Historian's Office.

[78]Deseret Evening News, November 21, 1873.

coast onto the upper track parallel with the quarry site.[79] The pattern of operations represented the letter "Z" the lower base being the main line, the top of the letter representing the quarry spur and the connecting line of the letter representing the spur track. When making the pick up the engine would attach to the rear car by means of a ring coupler and would pull the cars out onto the main track and run down to the Sandy Station backwards.

At Sandy the narrow gauge flats would be pulled alongside the Utah Southern standard gauge car, so close that the two beds were almost touching. Then by means of pinch bars and rollers, the granite blocks would be moved onto the standard gauge cars for shipment to the Temple Block.[80]

The efficiency of this operation is well illustrated by the following example of loading speed. On August 24, 1877, Utah Southern cars 21, 25, and 33, carrying 52,360 pounds of rock were receipted for delivery at the Temple Block. These cars were unloaded and switched back to Sandy

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[79]The loading operation was done by a home-invented windlass. Two men standing on a little platform would crank a wooden spool to which was attached a heavy rope. The crane had a mast and a jib arm. When a stone was tied, the two men, one on each end of the huge spool would turn with all their might until the stone was off the ground, the jib was then pulled around by extended ropes until the rock swung over the flat car; it was then lowered onto the flat car. The men on the end of the jib ropes then pulled the jib straight and tied or hooked another block. Later steam equipment was used. Interview with Mr. Kuhre.

[80]Interview with Mr. Kuhre.

and there again loaded in time to catch the afternoon freight and were receipted for 48,180 pounds of rock that afternoon on Temple Square.[81] Though such shipments seem significant, it should be noted that railroad revenue from granite shipments alone averaged approximately $20,000.00 a year. If it had not been for the tremendous mining activity in Alta the railroad would have had to be subsidized by the Church.

Though business seemed excellent, the railroad was seized for taxes in arrear for the years 1874-78. The company met its obligations for 1878, but with the boom period in Alta drawing to a close[82] the Wasatch and Jordan Valley was evidently forced into bankruptcy.[83]

In 1883 the line was purchased by the Denver and Rio Grande Western. Rock for the Temple was transported over this

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[81]L.D.S. Historian's Office, steel file under Wasatch and Jordan Valley Railroad Company.

[82]The Alta mining district shipped $13,401,108.00 worth of ore during the decade 1870-80. The population in the canyon was estimated at 6,500 during the summer months. During the decade 1880-90 ore shipments totaled only $1,703,968.00. See C. W. Lockerbie, "Short History of Alta," News Bulletin of the Mineralogical Society of Utah, IV (August, 1943), 22-3.

[83]Though no record of bankruptcy was found in the Third Judicial Court, action was brought against the company for $169,000.00. There is enough evidence in the court's brief to indicate that the Wasatch and Jordan Valley was placed under a receivership. See William M. Spackman v. The Wasatch and Jordan Valley Railroad Company, 5569, Third District Court in the Territory of Utah and County of Salt Lake (1883).

line for $8.00 a carload until the exterior work of the Temple was completed.[84]

The Temple Spur.--The terminus of the Utah Southern Railroad was at the depot of the Utah Central. All granite shipments came to this depot and from there had to be transferred for shipment up to the Temple Block, a distance of approximately one half mile directly east on South Temple Street.

On January 19, 1872, Brigham Young and others had organized the Salt Lake City Railroad Company, with capital stock amounting to $180,000.00, to construct single and double track street railroads for operation within the city. The initial run made on this new line was in the latter part of June, 1872, when one car made the trip down South Temple Street to the railroad depot.[85]

A spur track was soon proposed to Temple Block and on July 9, 1872, the railroad crews were busily engaged laying a rail into the enclosure.[86] On July 31 the first car of granite entered the enclosure. It weighed between ten and twelve tons and was pulled up the street railroad by two span

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[84]Trustee-in-Trust Vouchers, 1882-84, L.D.S. Historian's Office.

[85]Bulletin, Utah Power and Light Company, II (April, 1917), 32.

[86]Salt Lake Tribune, July 9, 1872.

of horses and two yoke of cattle.[87] This road used only sixteen pound[88] iron and was spiked on stringers about four by eight inches which were bolted to ties sunk into the ground.[89] Two sets of switches served to transfer the granite cars from the Utah Southern line onto the street railroad and then from this line on to the Temple spur at First West and South Temple.[90]

Whether any attempt was made to operate a train on this track is not known. On August 13, 1873, the company sought a petition from the City Council to use a locomotive on a second line of railroad which they proposed building from the depot to the Temple Block for the purpose of freighting rock for the Temple. The petition set forth that the iron that was now used was too light for the hauling of heavy freight, and that thirty pound iron would be laid on the new line.[91] The line was completed and on August 21, 1872, five carloads of rock were hauled by locomotive from the Utah Central Depot to the stone cutters on Temple Block.[92]

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[87] Deseret News, August 27, 1872.

[88] Ibid., June 20, 1872.

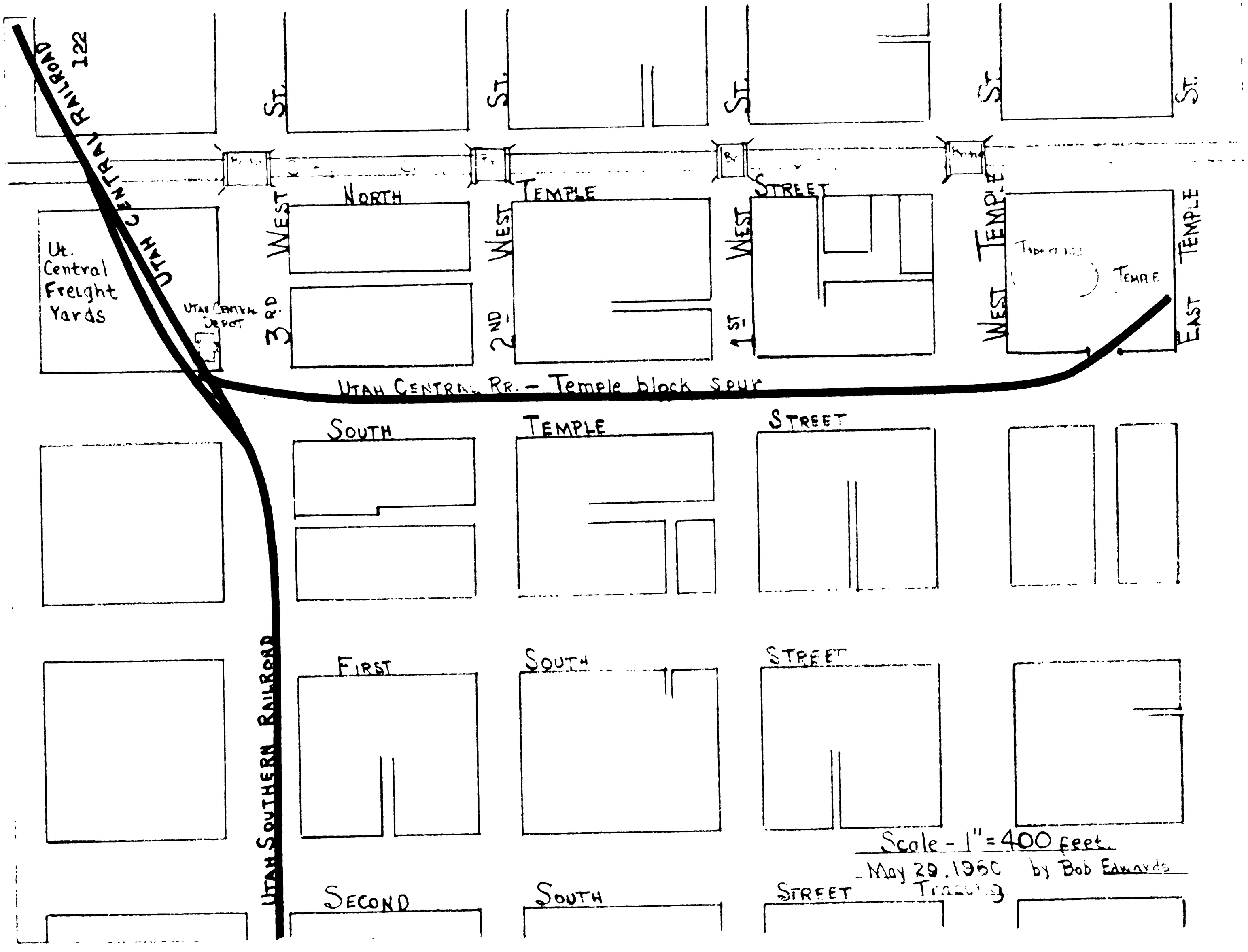
[89] Salt Lake Tribune, May 14, 1872.

[90] Deseret News, August 13, 1872.

[91] Ibid., August 14, 1872.

[92] Ibid., August 21, 1872. The railroad rate for switching the flat cars into Temple Block from the depot was $1.50. See Invoice Book for 1881, January 24, 1881, L.D.S. Historian's Office.

Temple granite was transported over this spur until the completion of the exterior in 1892.


UTAH CENTRAL RAILROAD
ST.
ST.
ST.
ST.
NORTH TEMPLE STREET
WEST
WEST
WEST
WEST TEMPLE
TEMPLE
EAST
Ut. Central Freight Yards
UTAH CENTRAL DEPOT
3RD
2ND
1ST
UTAH CENTRAL RR. – Temple block spur
SOUTH TEMPLE STREET
FIRST SOUTH STREET
SECOND SOUTH STREET
UTAH SOUTHERN RAILROAD
Scale - 1" = 400 feet.
May 29, 1950 by Bob Edwards

CHAPTER VI

CONSTRUCTION OF THE TEMPLE

It will be remembered that the Temple foundation had been covered with earth and resembled a freshly plowed field prior to the advent of the United States Army, which passed through Salt Lake City on June 26, 1858. The greater part of the populace of Salt Lake City had abandoned their homes and moved to the southern settlements, establishing temporary headquarters of the Church forty miles to the south, at Provo, Utah. On June 30, Brigham Young expressed his satisfaction with the army's conduct since arrival in the valley and announced that all who wished to return to their homes were at liberty to do so. On the same afternoon Brigham Young and his people began the move back to their city.[1]

A New Foundation.--With the United States Army, whose instructions and intentions regarding the Mormons were unknown, permanently encamped thirty miles southwest of Salt Lake City the Church resumed operations with a great deal of precaution. However, by the summer of 1860 preparations were underway to resume work on the Temple.[2] Brigham Young

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[1]Roberts, IV, 447.

[2]Millenial Star, XII, No. 34 (August, 1960), 542.

recorded that on December 18, 1861,

> The foundation wall of the Temple, which was temporarily covered up when the work theron [sic] was suspended in 1858, to prevent inquiry while the war cloud, then approaching from the east [sic] was passing over, have recently been uncovered and the rubbish cleared away preparatory to the commencement of the work of building early in the coming spring.
>
> There has been a large quantity of granite blocks hauled from the Little Cottonwood Quarry during the last two months, most of which has been squared and fitted for the places they are to occupy in the walls.[3]

As the foundation was uncovered large cracks were noted running through the walls of the first story and into the flagging and rubble work which was on top of the firestone foundation. Edward Parry, who was in charge of the mason work on the Temple at this time, reported to President Young that "the work on one side was defective and such a foundation is dangerous."[4] After serious consideration, Brigham Young and his advisors decided that the foundation would not support the tremendous weight of the granite that was to be placed upon it. One account gives Bishop Archibald Gardner a key role in the decision to start over:

> President Young dismissed the workmen, and sitting down on the foundation said, "Here I shall remain until the Lord reveals to me what I should do next."
>
> He had not been there long when father came into view. President Young motioned him to come to him. "Bishop, sit down," and then told him of his perplexing problem.

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[3]Manuscript History of Brigham Young, December 18, 1861, p. 49.

[4]Carter, II, 306.

Together they went carefully over the matter in hand. They examined the foundation, the materials, and the manner in which it had been put together. Then President Young said, "Bishop, can you tell me what to do?"

"Yes, President Young, the trouble has arisen through the use of too much mortar. The resultant settling has caused the walls to crack. It will be necessary for you to tear out the entire foundation and start over again. This time instead of using mortar, have each and all the stones in the foundation of the entire building cut to exact measurement and place stone upon stone with precise fittings. This will prevent cracking, settling or spreading in any way." President Young brought his hand down on father's shoulder and said, "Brother Gardner, you are right. That is my revelation."[5]

Albeit, Brigham Young directed a letter to Daniel H. Wells, the Superintendent of the Public Works, in which he said,

> I wish you, as speedily as possible, to have all the rock and flagging in the Temple wall taken up down to the top course of the foundation, and have that course hewn level to commence laying the Temple wall upon.[6]

The extent of adherance to the conditions of the letter is difficult to determine. It is reported that "the courses of the rock that had been laid on the wall were taken up, the rubble work removed, and more compact masonry substituted. The flagging and firestone were replaced, two courses of the former put down."[7]

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[5]Delila Gardner Hughes, Life of Archibald Gardner, Pioneer of 1847 (West Jordan, Utah: Alpine Publishing Company, 1939), p. 139.

[6]Brigham Young's Letterbooks, No. 5, June 4, 1862, p. 264.

[7]Anderson, The Contributor, XIV, 265.

In the few areas of the Temple foundation in which the footing of the side walls can still be seen, there is no evidence that these walls have ever been disturbed since their completion on July 23, 1855. The material is all rough cut firestone laid in lime mortar. It is possible at this position to see the ragged footing of the wall as it slopes toward its eight foot thickness at the basement story. On the exterior wall there is no sign of either a rubble or a flagging between the firestone and the timbers of the basement story. In other sections, basically those which serve as the pedestal support for the interior walls of the Temple, can be seen the top of the foundation on which rests a sixteen inch thickness of rubble work. The stones which form the rubble are firestone, very irregularly shaped, and laid in mortar and this is topped with two layers of sandstone flagging which are the first finished stones in the foundation and measure 22 inches in length, 22 inches in width and 7 inches in height. The first two or three courses of rock above the flagging of the interior walls are firestone.

In some places granite can be seen right next to the sandstone flagging, but it does not begin to predominate until the third and fourth courses of the basement wall. Many of the loose stones which had already been cut before the arrival of the army were cached when the foundation was filled. Evidently, even after the decision to use granite, many of these original firestone blocks were placed in the walls.

FOUNDATION STONES -
Note the inverted arch and the "G" in the upper picture and the conglomerate between the two main support footings in the lower picture.

Personal photograph taken July 1, 1960.

The poorest cut stones in the building are those which form the pedestal for the inner walls and act as support for the basement floor. These appear to be only firestone boulders set in mortar. In order to strengthen these partitions a heavy gravel fill has either been placed or was left between each partition from the foundation level to the supporting timbers of the basement story.[8]

Each of the four corner towers rests on an ashlar footing eight feet in depth and twenty-six feet in width and the two center towers are on a similar foundation which is thirty-one feet square.[9] In each of the corner towers there are two inverted arches, which are uniquely designed to distribute the massive weight of the walls on the foundation. These are one quarter arches and are perfectly laid, the bowl of the arch sitting on the first course and terminating in the third course. The line of the basement story commences two and one-half feet above the top of the footing where the thickness of the walls is eight feet and remains constant until the top of the first story. The extent to which these arches were used beyond the foundation level is difficult to determine. Most of the interior walls are painted or decorated and in only a few locations can any trace of interior arching be seen.

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[8]Personal observation made on May 8, 1960.

[9]Millenial Star, XXXVI, No. 18 (May, 1874), 271.

Work proceeded on the removal of the poor masonry into the summer of 1862. The Deseret News of June 6 reported that workmen were busily engaged taking up part of the old foundation preparatory to laying the huge Cottonwood stones on the smaller rocks. Evidently Bishop Gardner's advice had been carefully followed because this paper further reported that "All the stones were painted and had numbers indicative of their place in the wall."[10] The granite stones that were laid one course above the flagging amid the predominant firestone are all numbered alphabetically. Two of these first granite stones in the first course above the flagging still carry their initial letters, "G" and "H".[11] This pattern of including each stone and its position in the building was the responsibility of the architect and was followed throughout the rest of the structure.

The Millenial Star on July 25, 1863, mentioned that the building was rising from its foundation as fast as teams could be found to transport the rock.[12] In 1864 the same source printed a letter from Brigham Young which said,

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[10]Deseret News Weekly, June 6, 1862. The irregular placement of the granite stones amidst the firestone of the foundation at the eight foot level indicates some repair but due to the nature of the foundation it is difficult to determine the extent of replacement.

[11]Personal Observation.

[12]Millenial Star, XXV, No. 30 (July, 1863), 476.

> The great cost and little return in sending teams to the frontier for the poor seem to require us to omit sending trains there next season, that we may expedite the work on the Temple. . . . Thus they [immigrants] will enable, instead of retarding, to aid and assist in building up the Temple of the Lord to its completion.[13]

Brigham Young on August 31, 1864, instructed Bishop John Sharp to let out contracts for the laying up of the walls of the Temple[14] and on May 27, 1866, the contractors Brain and Worthers had completed the east end of the Temple to the first water table, and the west end was rapidly nearing ground level.[15]

The basement had been contracted at twenty cents a square foot. The total cost as reported in the Journal History was $10,087.60.[16]

Preparing and Placing the Stones.--Upon the return of the people to their homes the public works were reopened, but they were never again centralized on the Temple Block. Most of the little shops opened their doors on a competitive basis and were scattered throughout the city.

The largest force of men on the Temple Block were the stonecutters. A few good masons could lay the stones cut by

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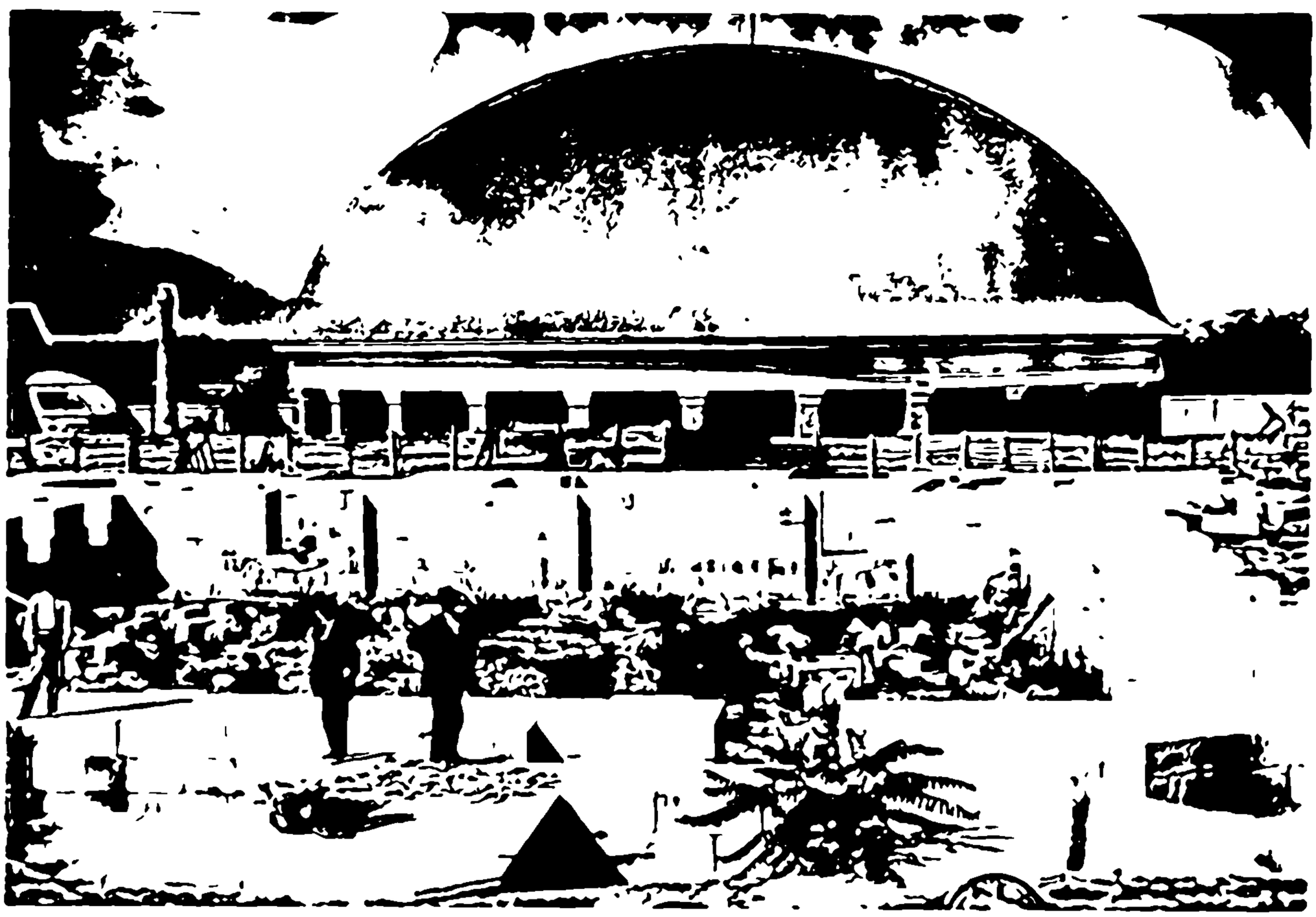
[13] Ibid., XXVI, No. 38 (September, 1864), 601-2.

[14] Letter to Daniel H. Wells from Brigham Young. Ibid., No. 45 (November, 1864), p. 718.

[15] Deseret News Weekly, May 27, 1866.

[16] Deseret News, November 8, 1878.



Temple foundation, 1870
note buttresses and the inverted arches

L.D.S. Historian's Office.

a large crew of fifty to eighty stonecutters with comparative ease. Most of the rough cut stones used in the foundation were squared right on the ground where they had been dropped by the teamsters. The men received their assignments from the pattern maker and then blocked up their stones and went to work. In a busy season the Temple Block was a veritable hive of activity. Such a large force of men with hammers and chisels, diligently at work, hewing out the huge blocks must have been an impressive and pleasing sight. Stonecutting shops existed and evidently this is where the fine stones were shaped.

Bringing the rock directly into Temple Block on the street railroad spur centralized the unloading of the granite and provided a more consistent supply. In 1876 five large sheds, located south of the Temple between the Temple walls and the railroad spur, were erected for the purpose of protecting the stonecutters from the inclement weather. The sheds were open on both sides, covered with a thatched roof and two of these sheds running east and west measured well over one hundred feet in length. The finished stones were stacked in columns, arranged according to their position in the walls. The granite chippings were raked up and utilized, generally for paving the city streets.

Some of the principal tools used by the stonecutters were the chipping hammer, the granite axe, a single-jack hammer, the bull set, a face chisel, a chipping chisel,

Two Wheeled Granite Wagon
used only on the Temple Block

L.D.S. Historian's Office.

This picture depicts the temporary sheds which were constructed in 1876. The rubble pile and the system of stacking can be clearly seen. The railroad spur shows about seven cars which have been unloaded.

L.D.S. Historian's Office.

truing blocks, and the point or finishing drill. Taking the earth stone for example the following steps may well have been followed. The bull set would only have been used if the block had arrived extremely rough and it was necessary to flake off a great deal of the granite to square or shape the stone to its desired dimension. When the face side of the stone was selected, the stone was placed on blocks at a convenient height for the cutter. A small spot in each of the four corners was leveled to set the four truing blocks.[17] With the blocks squared and leveled the stone was then chalked at the desired dimension. The facing chisel and the single-jack hammer were used to knock off the rough edges and to true and lay the stone as accurately as possible with the chalkline. When the face and sides of the stone were in a finished state, the design of the stone would be tapped on. The deep inset work of the four corners would be done with a heavy point drill and the hammer and to finish and smooth the facings of the design a small chisel would have been used. Though work in these small corner crevices may appear delicate, a very hard and heavy blow was required to chip off a fraction of stone. The line of the globular relief in the center of the stone would be traced and chipped out with about a 5/8 inch

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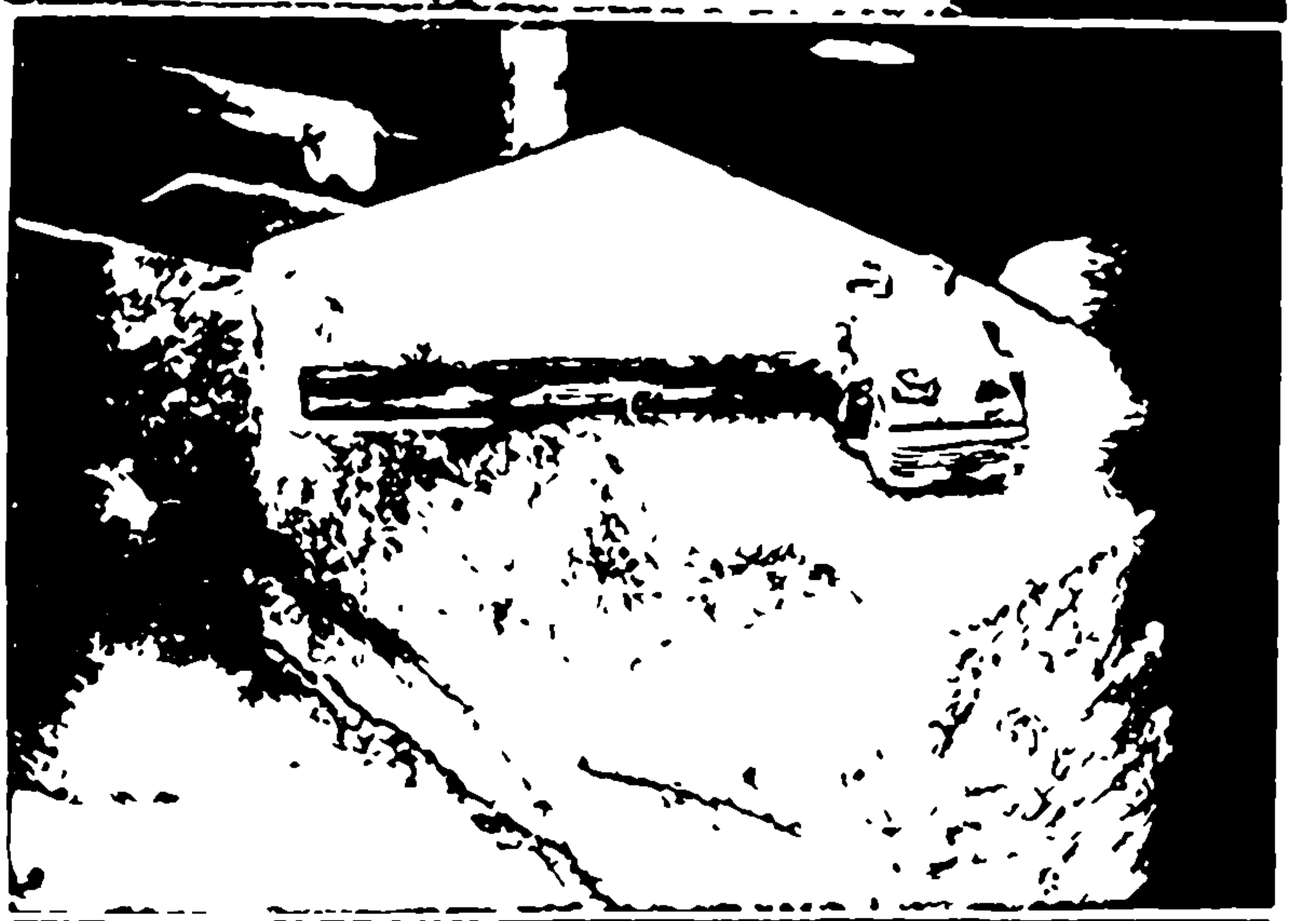
[17]The blocks depicted may or may not be the exact type used. Nevertheless, both Mr. Child and Mr. Johnson agree that blocks similar to these must have been used by the Temple stonecutters to true the stones.

Truing blocks

Granite Axe



Facing chisel
Point chisel

Personal photographs of the Salt Lake Monument tool collection.

point or stone chisel. The sill of the sphere would be trimmed with a smaller drill and finished with the chipping chisel and on the heavy convex face of the stone a chipping sledge was probably used to gain the contour. For the fine facing and turning of the sphere the granite axe would have been used. Most of the tools had to be sharpened daily and eight or ten blacksmiths would be required to do this work. Each stonecutter, like all other craftsmen, used those tools and skills which for him served his purpose best and the above sequence may have varied considerably.[18]

Each of the 50 earth stones measured 5 1/2 feet in height, 4 1/2 feet in width, 20 inches in depth, had a globular face measuring 3 feet 11 inches in diameter, weighed 5,600 pounds and is estimated to have cost about $300.00.[19]

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[18]Based upon interviews with Stan Johnson on March 11, 1959, and Thomas Child on June 5, 1959, both master stonecutters and both very familiar with the skills and techniques of many of those men who worked on the Temple, having served apprenticeships as boys with some of these artisans.

[19]What type of mechanical equipment was used in cutting and preparing the stone is difficult to ascertain. In a letter from Brigham Young to John Taylor in New York, dated July 28, 1858, John Taylor was instructed to investigate a new machine which was operated by water power and was designed for cutting hard granite. He was asked to "ascertain all the facts connected with its arrangement, expense, facility for keeping order, quality of the work, and facility for changing from one kind of rock to another, permanency of its general utility." He was further instructed not to buy the machine but to forward all the facts and figures. See Brigham Young's Letterbooks, II, July 28, 1892, p. 892. No record of purchase was found.

Though a large force of stonecutters was kept at work until the time of completion, it is difficult to believe that with the coming of the steam age some type of mechanization was not used to cut the stone.

In questioning Mr. Johnson and Mr. Child about the possibility of that much labor being in the stones, both agreed that considering transportation and the fact that a cutter could have easily spent an entire month on one such stone, the cited cost was very possible.

In August, 1873 the Deseret Evening News reported that four miniature models of a derrick had been made and that these were to serve as a pattern for a new hoisting apparatus for the Temple.[20] These new derricks were constructed and on the 13th of September were in operation.[21]

Three principal implements were used to hook the block to the winch lines of the derrick. The granite hook was the easiest and quickest simply requiring a small chip made in each end of a rough cut stone with a point or other type drill. Two hooks, one on each side of the block were set in the indentations and when the line was pulled taught these drew into the stone, capable of holding a tremendous weight. The ring pins were used extensively and evidence of their use can still be seen on the stones of the towers. On the spire stones, two small holes were drilled, just large and deep enough for the insertion of the pins, high enough on the block so as to place the balance of weight on the lower half of

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[20] Deseret Evening News, August 16, 1873.

[21] Ibid., September 13, 1873.

Granite hook

Ring pin

Lewis pin

Personal photographs taken of the Thomas B. Child tool collection.

the stone. The pins were then inserted and hooked to the cable by the rings. If the stone were to be set flush between other stones, the holes would be drilled on top at forty-five degree angles toward the center of the rock and the pins binding against the bottom of the drill holes angled to hold the rock. Requiring greater labor, but utilized for the same type of setting was the lewis pin for which a triangular hole with the base in the stone and the narrow end as the opening, would be drilled in the center of the top side of the block. The two outside slips would be placed in the hole, the center space filled with the wedges until tight, the hook lined up, the pin inserted, and when pulled taught, this pin held a heavy stone and provided for easy maneuverability.

When the four new derricks were moved into the Temple building, one was placed in each corner tower. The mast was held upright by guide lines anchored to the ground and to the top of the other masts. A long jib pole was connected to the mast level with the hoisting platform. This platform was movable and was either shimmied up the pole or reconstructed as the walls approached the level of the boom. The Deseret Evening News shed some light on this procedure when it reported that,

> By tomorrow night five additional courses of rock will be laid on a little over one-fourth of the walls

> of the Temple, after which the hoisting[22] apparatus will be removed and adjusted that the laying may be continued to the same extent around the whole building.[23]

Evidently only one hoisting engine was used to operate all the derricks in the early years. A tourist passing through Utah in the fall of 1877 wrote in regards to the Temple that "They build entirely without scaffolding by means of a small portable engine inside, which works lofty cranes with jibs of such length and strength as to pick up the heaviest stones outside and deposit them on the walls."[24]

The hoisting apparatus was moved from corner to corner on the completion of approximately each five courses of rock. An example of the operation is given in the following sequence. On July 13, 1877, the hoisting apparatus was moved from the northeast quarter to the northwest quarter preparatory to laying five courses of rock on that sector.[25] On August 17, 1877, the laying of five courses on the northern half of the building was completed and the hoisting engine

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[22]The spool of the first derrick evidently was turned by hand. On August 16, 1876 the Historian's Clerk reported that "an eight horsepower steam engine replaced hand power for raising the blocks and it is three times as fast." See Historian's Office Journal, August 16, 1876.

[23]Deseret Evening News, September 5, 1876.

[24]Vivian H. Hussey, Notes on a Tour in America from August 7th to November 17th, 1877 (London: Edward Stanford, 1878), p. 108.

[25]Deseret Evening News, July 13, 1877.

was moved diagonally across the building to the southeast corner preparatory to starting five courses of rock laying on that sector[26] and on September 27, 1877, these courses being completed, the apparatus was moved to the southwest corner of the building and five courses were completed in that sector. During this entire period of time five courses of rock were laid completely around the Temple and the hoisting engine was moved four times with each move requiring approximately one-half day.[27]

In 1878, when the walls were about forty feet in height, a new hoisting method was tried. The granite stones were loaded on a small truck and were run on an iron tramway along an elevated platform into the center of the building, hoisted by a steam engine to a platform adjacent to and level with the height of the walls, placed on another small truck and conveyed to the east or west end of the building, and then lifted by the derrick and set in position for the masons.[28]

In 1878 the derricks were so high and the leverage so great that two granite pillars were constructed as anchors for the cables on the eastern side of the Temple.[29]

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[26] Ibid., August 17, 1877.

[27] Manuscript History of Brigham Young, p. 3219.

[28] Deseret Evening News, May 23, 1877.

[29] Ibid., June 10, 1881.

To avoid the loss of time in shifting from one end of the building to the other, the stationary hoisting engine that was used on the Logan Temple was brought to Salt Lake and placed in position in the west end of the Temple building. With this addition, work could be carried on simultaneously in both ends of the structure.[30]

The Deseret News on November 2, 1889, reported a new apparatus for handling stones on top of the building as work progressed on the towers.

> In this there are two cranes, one each for the east and west end of the Temple. They are built to carry a load of two tons and have a traverse motion of about twenty four feet and will lift and deposit a rock at any point within these limits, exactly as wanted. The main bridge consists of two wrought iron "I" beams, with wheels at each end to run on the main track, while a trolley carries the weight and travels on the bridge. The men who work the crane are stationed on a platform at one end of the bridge, and hoist the load and traverse the crane in all directions without leaving their places.[31]

Due to the thickness of the walls, seven feet on the first story and six feet on the second story, extensive scaffolding was not used. The only exterior scaffolding used was during the last few years when the towers were laid above the first battlement and the thickness of the walls of the spires was considerably narrower.

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[30] Ibid., October 31, 1885.

[31] Deseret News Weekly, November 2, 1889. This crane was designed and constructed by The Salt Lake Foundry and Machine Company.

Accidents.--Though extreme caution was employed on the Temple and the workers were continually exhorted to labor with care, there were several serious accidents.

On January 12, 1855, Archibald Bowman, twenty-seven, was killed at the Quarry in Red Butte.[32] On the 28th of May, 1878, William McCibon fell thirty feet to his death while wheeling rock on the Temple.[33] The next death occurred on October 3, 1881, when William Pullen fell from the Temple walls into the basement.[34] The last death noted was on February 17, 1890, when Robert Ford fell from a Temple window.[35] Although several injuries occurred on the trains and by rolling rocks, no multiple accidents due to carelessness were encountered.

Laying the Courses.--It was not until 1867, fourteen years after the commencement, that the Temple walls finally rose above the surface of the ground. A paramount factor contributing to such a delay was transportation and only after this problem was solved in 1871-72 could work continue relatively unabated until the building was completed.

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[32]Millenial Star, XXVII, No. 17 (April 28, 1855), 267.

[33]Salt Lake Tribune, May 29, 1878.

[34]The Contributor, III, No. 2 (November, 1881), 30.

[35]Deseret Evening News, January 18, 1890.

With the abundance of stone available after the arrival of the railroad, the responsibility for expediting the work fell upon the stonecutters. The stones which constituted the foundation were all rough cut and did not require the skills of the fine stone cutters and many of the master stonecutters served their apprenticeships hewing out these stones. Commencing with the stones of the basement story all of the granite blocks were to be cut and laid according to the specifications of the Church architect. This required great skill and men such as Peter and Alexander Gillespie, Stephen Hales, Peter Fairclough, Henry Woollacott, Alvin Winegar, William Ward, Benjamin T. Mitchell and James Standing worked with their foreman, Alonzo H. Raleigh, in the fine cutting of these stones.[36]

Though the public works had an apprentice program in operation there never seemed to be an adequate supply of skilled craftsmen. Efforts were made through the Church missionary program in Europe to obtain immigrants who were masters in the various crafts. In 1857 the Presidency of the Church issued a call to all stone cutters in the outer fringes of the territory to abandon their pursuits and to come to Salt Lake City to work on the Temple.[37] On October 11, 1874, the

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[36]Anderson, The Contributor, XIV, 263.

[37]Diary of William Adam, p. 23 (Manuscript copy in Brigham Young University Library, Provo, Utah).

preponderance of rough cut stones prepared for the inner courses over those cut for the exterior courses of the Temple necessitated the dismissal of fifty apprentice stonecutters.[38] The Deseret Evening News of December 5, 1876, reported that

> A very large amount of inner cut rock, for the inner portion of the Temple walls is already prepared, eight courses of that class of material being pretty well advanced. On account, however, of the preponderance of workmen who are capable of doing only the rough dressing over those sufficiently skilled to do the fine work, the surface rock lags considerably behind. . . . Already the large quantity of rough stone lying around the block requires that space be economized. . . . With the present force of fine stonecutters it would take most of the winter for them to prepare the base stringcourse, which goes entirely around the building.[39]

Though a crew of between ninety and one hundred and fifty men were continually employed on the Temple, progress seemed slow. By October 21, 1876, the News reported that "three hundred and sixty carloads of granite rock has already been delivered on the Temple Block this season."[40] During the annual April conference of 1876, it was decided by unanimous vote that the priesthood quorums were to keep two hundred laborers employed on the Temple from that time until the completion of the building.[41]

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[38]Journal History, October 11, 1874.

[39]Deseret Evening News, December 5, 1876.

[40]Ibid., October 21, 1876.

[41]Andrew Jenson, Journal, B, April 9, 1876, p. 513.

The laying of one or two courses of rock each year seemed to add little to the building; yet in each course below the third water table there are approximately six hundred cut stones, the preparation of which required an enormous amount of labor.[42] Each course measured close to fourteen inches in height and each stone had to be cut perfectly true on each of its six sides. At the close of the season in 1874, the foreman of the masons, T. P. Thomas, reported that during the year 38,000 cubic feet of rock had been laid on the Temple walls and giving credit to Truman O. Angell, Thomas reported that not a single stone, after being prepared according to the instructions given, had to be altered in any way.[43]

At the close of each season's work the walls of the Temple were covered over with wooden shedding, to protect the masonry work from the inclemency of the winter weather.[44] With the coming of spring the shedding was set aside and work once again commenced on the walls of the Temple, but as the walls loomed higher and shedding became impractical, the top course was covered with a layer of mortar as a deterrent against the moisture.[45]

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[42]Anderson, Contributor, XIV, 265.

[43]Deseret Evening News, November 28, 1874.

[44]Deseret News Weekly, May 7, 1873.

[45]Ibid., December 1, 1876.

In the center of each of the four corner towers there is a granite colonnade which extends from the foundation to the top of the square. The diameter of the colonnade is six feet with a two and one-half feet circular opening in the center. There are one hundred and seventy-two stairs, that wind around each of these granite colonnades to form four beautiful and massive granite winding stairways.

The steps are imbedded in the side walls of each of the corner towers and are cut so as to conform with the curve and ascent of the newel. Each step has been cut in one solid piece and is five feet three inches long, six and one-half inches high, twenty-one inches wide upon its setting in the inner wall of the tower and nine inches wide at its niche in the newel, and overlaps approximately one and one-half inch in such a manner that it cannot move or be moved without breaking the masonry.[46] Each stone weighs a little over 1,700 pounds,[47] which constitutes a gross weight, in the stairways alone, of 1,169,600 pounds.

Each new course of rock was generally commenced on the southeast corner and laid around the building. By 1876, work had proceeded to the first of the basement story windows with the coursework laid just below the sill of the windows set in

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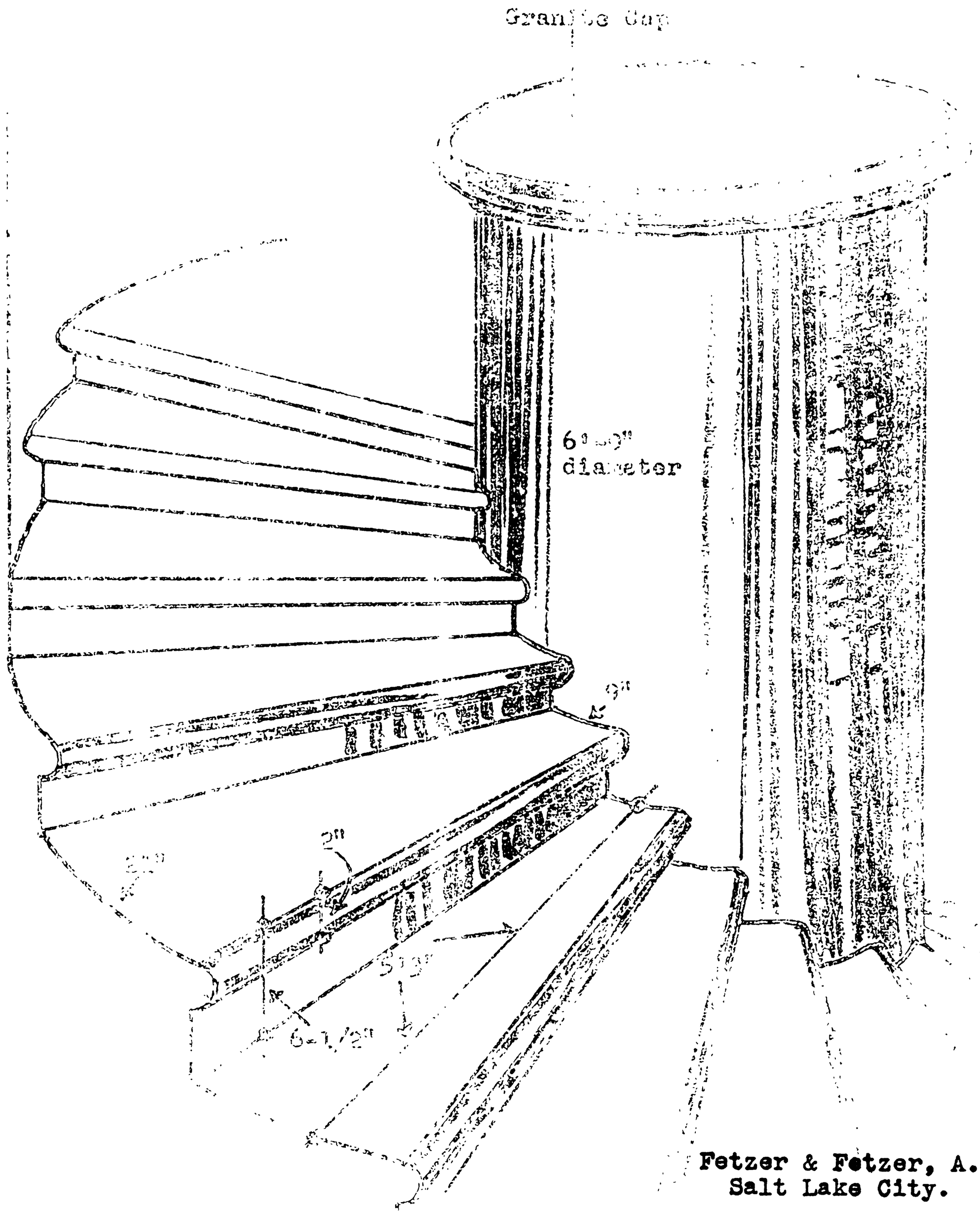
[46]Personal observation and measurement.

[47]Lundwall, p. 137.

Solid Cedar Tundra Stone Stair



Fetzer & Fetzer, A.I.A.
Salt Lake City.

from the outer layer of the wall to make room for the first, or as it is called, the base water table.[48] A large number of pedestals, the middle portion of which were cut in globular form, had been placed in the buttresses of the Temple. These stones are known as the earth stones and there is one near the base of each buttress. The year 1875 saw the laying of the first string course or water table with these stones, like the base water table stones, set in the building to provide for the yet uncut stones of this table. On September 30, 1876, an additional six feet three inches had been added to the walls[49] which made the building close to twenty-four feet in heighth.

On May 21, 1877, the year of Brigham Young's death, work commenced for the season with one hundred and twelve men laboring on the Temple.[50] During this year, both the base and the first stringcourses were laid[51] with stones cut from

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[48]The water table served a functional as well as a decorative purpose. The out-setting of these stones breaks the moisture run-off thus protecting the foundation and mortar joints.

[49]Deseret Evening News, September 30, 1876.

[50]Ibid., May 21, 1877.

[51]Mr. Thomas Child believes that these stones are the finest and the most difficult cut stones in the building. He believes that this is probably the reason they were not laid along with the other courses. They were dependent upon the stonecutters' gaining the confidence and skill necessary to cut them. The Deseret News in 1874 reported that these stones were to be cut from a [marble] rock located in Emigration Canyon. The choice of material may have been a factor in the delay, but they are of granite. See Deseret Evening News, August 13, 1874. [See Temple pictures for 1874-75.]

granite and run completely around the building. This is beautifully executed work and each stone in the base string-course is cut from one piece of granite in such a manner as to leave no joints of masonry in heavy moisture areas. The mortar joints of the blocks are staggered from right to left on the buttress at the level of each water table, thus eliminating as much as possible the danger of cleavage.

By the summer of 1879 the Temple walls were forty-five feet high. The work during the season had included the turning of the oval windows, laying the fifty moon stones and the completion of the second water table.

A rather comprehensive report on the stature of the building appeared in the Deseret Evening News of June 10, 1881.

> The other evening rock laying on the Temple was resumed. . . . The work began on Course A of the third alphabet from the base, at a height of about 60 feet above the ground. The interior hight [sic] is about 12 feet more. The work this season will probably comprise six or seven courses which, with 14 3/4 inches to the course, will elevate the structure some seven or eight feet higher. This work will include the springing of 44 arches. Above this set will come a set of oval windows, which will be the last windows on the side walls, as then the structure will have reached the square, about eighty feet from below. After the building is completed to the square, two sets of tower windows remain to be constructed.[52]

Work continued unabated and by the end of the season in 1883 the walls stood eighty-five feet four inches above

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[52] Deseret Evening News, June 10, 1881.

Temple walls, 1877
note the indented course for the two water tables and the earth stone which is placed between.

L.D.S. Historian's Office.

the level of the promenade. The walls at this height are six feet thick and with the turning of the arches for the top set of oval windows are ready for the roof timbers. The paper reported that two thousand five hundred tons of granite had been laid on the Temple that season. The year 1883 was one of great accomplishment. According to the pictures the Temple was only a few courses above the second water table in 1882.[53]

The Deseret Evening News, October 31, 1885, reported that

> The work of rock laying on the Temple, in this city, this season, has been confined to the east end until today, when, the towers being squared up, the workmen reported to the west towers and commenced operation there. During the season sixteen courses of rock, aggregating 20 feet 8 inches in height, have been laid upon the center one of the eastern towers; [sic] and fourteen courses--18 feet--upon each of the corner towers. If the weather continues favorably, as it did last year, there will probably be about four courses laid on each of the towers at the west end before the work is abandoned for the winter.[54]

The battlements were erected in 1886. They follow the course of each buttress approximately seven feet above the roof level or third water table. There, at almost one hundred feet above the promenade they terminate with a huge granite domed cap.

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[53] Deseret News Weekly, November 14, 1883. In order for the building to have been as reported, forty-two long windows and forty-two oval windows would have had to be set and turned. In addition fifty star stones would have had to be hewn and laid. The pictures do not depict this state of completion until the close of the season in 1884.

[54] Deseret Evening News, October 31, 1885.

At the close of the season for rock laying on November 2, 1889, the structure stood a little over one hundred and sixty feet above the ground,[55] and with the work of two additional seasons the final stone, called the capstone, was laid in position on April 6, 1892.[56]

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[55] Deseret News Weekly, November 2, 1889.

[56] Ibid., April 6, 1892.

Salt Lake Temple in
relative stages of construction

L.D.S. Historian's Office.

CHAPTER VII

THE ARCHITECTURE OF THE TEMPLE

Plans and Supervision.--The resumption of Temple construction after the Utah War produced no substantial change in the working relationship between the Church Architect and President Brigham Young that they had obtained during the first five years of construction.[1] Ill health forced the resignation of Truman O. Angell, and at his suggestion William H. Folsom was sustained as Church Architect in 1861. Work proceeded slowly, and when Angell, health improved, was reappointed Church Architect in 1867 with Folsom as assistant, Angell and his wife moved into a little room on Temple Block and faced a task "enough for twenty men."[2] During these busy times he wrote:

> I have made myself reconciled to the President's wishes. With his conclusion, whatever is his wish, the Lord will sustain for he seems to dictate all that he does. At least, this has been my present views [sic] and no mistake of that. All I ask is to know the mind of President Young to me and my way is clear.
>
> . . . . . .
>
> I overhauled the drawing of the Temple, that Brother Folsom has had in his charge and I spent the day and much of the nite on my pillow to see how I might gather

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[1]See Chapter II.

[2]Ashton, p. 140.

> the fragments of the work that was partly done. I will here state that the drawings saved for me I made at some 8 or 12 years ago.[3]

In the late 1860's and 1870's a tremendous amount of work was accomplished. With Truman O. Angell, Jr. and Folsom as assistants, the Church Architect's office developed plans for the Salt Lake Tabernacle, the Temples at Manti, Logan, and Saint George, and numerous public buildings. In addition the steadily increased demands to expedite the completion of the great Temple in Salt Lake City had to be carefully executed.

The architects' planning sheets were two or three courses ahead of the stone setters. In March, 1867, Truman O. Angell recorded in his diary that "Every stone will be lettered, numbered and billed to their proper places and in fact this office will conduct all the branches even to the stone quarrying, bills will show the stone quarrymen where each stone is to go."[4] From this time forward, each stone was depicted for its position in the wall and its specifications were listed. Three diagrams were made for each setting of stone, along with a descriptive bill. One diagram was sent to James C. Livingston at the quarry, one was given to the foreman of the setters and one was retained in the architects' office. Most of the plans were drawn depicting the course

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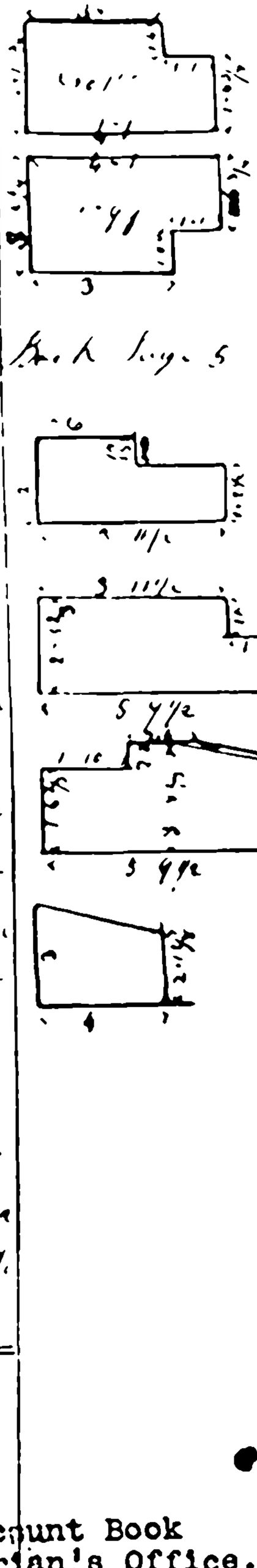
[3]Angell, March 16, 1868 and July 18, 1867.

[4]Angell, March, 1867.

No. on Diagram	No. of Blocks	Length ft. in.	Width ft. in.	Thickness in.	Diagram	No. on Diagram	No. of Blocks	Length ft. in.	Width ft. in.	Thickness in.	Diagram
50.	4.	1-7	4-	15½		96	2	4 10	5-	15½	
52.	4.	3-5	4	15½		96.	2.	3-5½	5 5	15½	
53.	4.	0-0	0 0	15½	See Pattern	97.	2	3 5½	5 5½	15½	
54.	4.	0-0	0 0	15½	See Pattern	98	2	4 5½	5	15½	
55.	4.	0 0	0 0	15½	See Pattern	99	2.	0 0	0 0	15½	
56.	4.	3 1	2 4	15½		100	2	0 0	0 0	15½	
57.	4.	3 7½	3 2½	15½		101	2	4 10	2 11	15½	
58.	4.	0-0	0 0	15½		101	2.	2 10	2 11	15½	
71.	4	3 3½	4	15½							
72.	4.	4-2	4	15½							
59.	4.	2 6½	3	15½			2	2 5	2 6	15½	
60.	4.	0 0	0 0	15½			2.	0 0	0 0	15½	
61.	4	2 5	2 6	15½							
73.	4.	3 7	3	15½							
74.	2.	4-0½	3	15½			2.	0 0	0 0	15½	
74.	2	0-0	0-0	15½			14.	2 3½	3 7½	15½	
75.	2.	4-6½	2-11½	15½							
75.	2.	1-8½	2-11½	15½			8.	0 0	0-0	15½	
76.	2.	0-0	0-0	15½	See Pattern		8	3 3½	4-	15½	
76.	2.	0-0	0-0	15½	See Pattern		8	0 0	0 0	15½	
77.	4.	4-6½	2-11½	15½							
78.	4.	4-6½	3-	15½							
79.	2.	2-10¾	2-11½	15½							
80.	2.	0-0	0-0	15½		167	14.	3-3	1-6¾	15½	
81.	2.	0-0	0 0	15½		168	8	3-2	1-2¾	15½	
82.	2.	3-6½	2 11½	15½		126	14.	3 2	1-6¾	15½	
83.	2.	3 3¾	5 5½	15½			16 4				
84.	2.	3-5¾	5 5½	15½							
85.	2.	4-8½	3	15½							
86.	2.	4-8½	3	15½							
87.	2.	2-2¾	3-11½	15½							
89.	2.	4-8½	3-	15½							
90.	2.	4-2	3-11½	15½							
91.	2.	4-1	2-6	15½							



Rock Quarry Account Book
L.D.S. Historian's Office.

work for only one section of the building, with instructions to reverse the plan for the opposite end of the building. The four corner towers are identical and often one drawing sufficed for the stonework of all. Many of the drawings had written instructions directed to the setter or foreman, giving the particulars on how the stone was to be laid. It is interesting to note that on June 10, 1881, Course A of the third alphabet was being placed in position.[5] Less than ten years later, in January of 1891, the final drawings for Courses W, X, Y, Z of the sixth alphabet were completed.[6]

In 1877 the architectural labors of four temples became so demanding that Angell assigned Folsom to take over the Manti Temple and Truman O. Angell, Jr. to assume the responsibilities of the Logan Temple.[7] His own chief concern remained the great structure in Salt Lake City and to this end he dedicated the remaining years of his life. While returning home from his labors he became very ill and died from dropsy on October 16, 1887. For forty-two years he had served the Church as a builder,[8] thirty-four of these on the Temple.

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[5]Deseret News, June 10, 1881.

[6]Temple Plans. A stack of these drawings was recently found in the L.D.S. Historian's Office.

[7]Ashton, p. 152.

[8]Truman O. Angell's patriarchal blessing given by John Smith in 1845 said, "Thy calling is more particularly in laboring to assist the Saints to build cities and temples than

Well might the inscription, which he had noted as a missionary to England, on the small marble marker over the grave of Sir Christopher Wren, the architect of St. Paul's Cathedral, be his. It read, "Reader, if thou seekest his monument, look around."[9]

No architect was officially sustained to take his position until April Conference of 1890, when Joseph Don Carlos Young, son of Brigham Young was sustained as Church Architect.[10] Truman O. Angell, Jr. had oversight of the work during the interim.[11]

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traveling abroad to teach the gospel.

The Lord shall give you wisdom to teach the principles of architecture which hath been held in the Church everlastingly. See Marvin E. Smith, "The Builders," Improvement Era, XLV, No. 10 (October, 1942), 630-1.

[9]Though the conference reports from 1871 to 1887 list Truman O. Angell as the sustained Church Architect, Brigham Young's Letterbooks indicate a different story. On August 4, 1871, Truman O. Angell resigned, much to the regret of Brigham Young. He was asked to turn all of his plans and other property over to his son. See Brigham Young's Letterbooks, August 4, 1871.

On September 5, 1876, Truman O. Angell, Jr. was notified that "Elder W. H. Folsom having [sic] been appointed to succeed you as architect of the Church . . . you will have the kindness to hand over to him all books, paper, plans, drawings and other property of the Church." See Brigham Young's Letterbooks, September 5, 1876. This change evidently was the result of a salary dispute. A letter on the 14th inst. reads in part, "We regret to inform you that the circumstances and conditions in which we are placed render it necessary for us to decline your invitation, and we will accept of your resignation. Men that dictate the affairs of this great work do not place price upon their labors." See Brigham Young's Letterbooks, September 14, 1876.

[10]Millenial Star, LII, No. 20 (May 19, 1890), 308.

[11]Deseret News, April 16, 1892.

Architectural Style.--The architectural design of the Kirtland and Nauvoo Temples and also those constructed in Utah, prior to the completion of the Salt Lake Temple, indicate a strong general relationship to the typical meetinghouse of Ohio and Connecticut. The simple rectangular plan and the gabled roof with the lone spire is typical of the Protestant revolt against the Catholic forms of architecture. Many of the leaders of the Church of Jesus Christ of Latter-day Saints were products not only of New England but of the Puritan blood as well so both in genealogy and geography the Early American Meetinghouse has influenced Church architecture.[12]

Concern for architectural style has been one of the last considerations of the Church. Sheldon Cheney wrote in regards to church architecture in general,

> After food, clothing, and shelter, then structures dedicated to the Spirit, so much is true: Man may not make consistent spiritual progress without the necessities cared for. Only with the coming of a margin of unhurried leisure for conscious cultivation of beauty, for philosophic and scientific speculation, for spiritual adventure, does he need an architecture beyond elementary shelter.[13]

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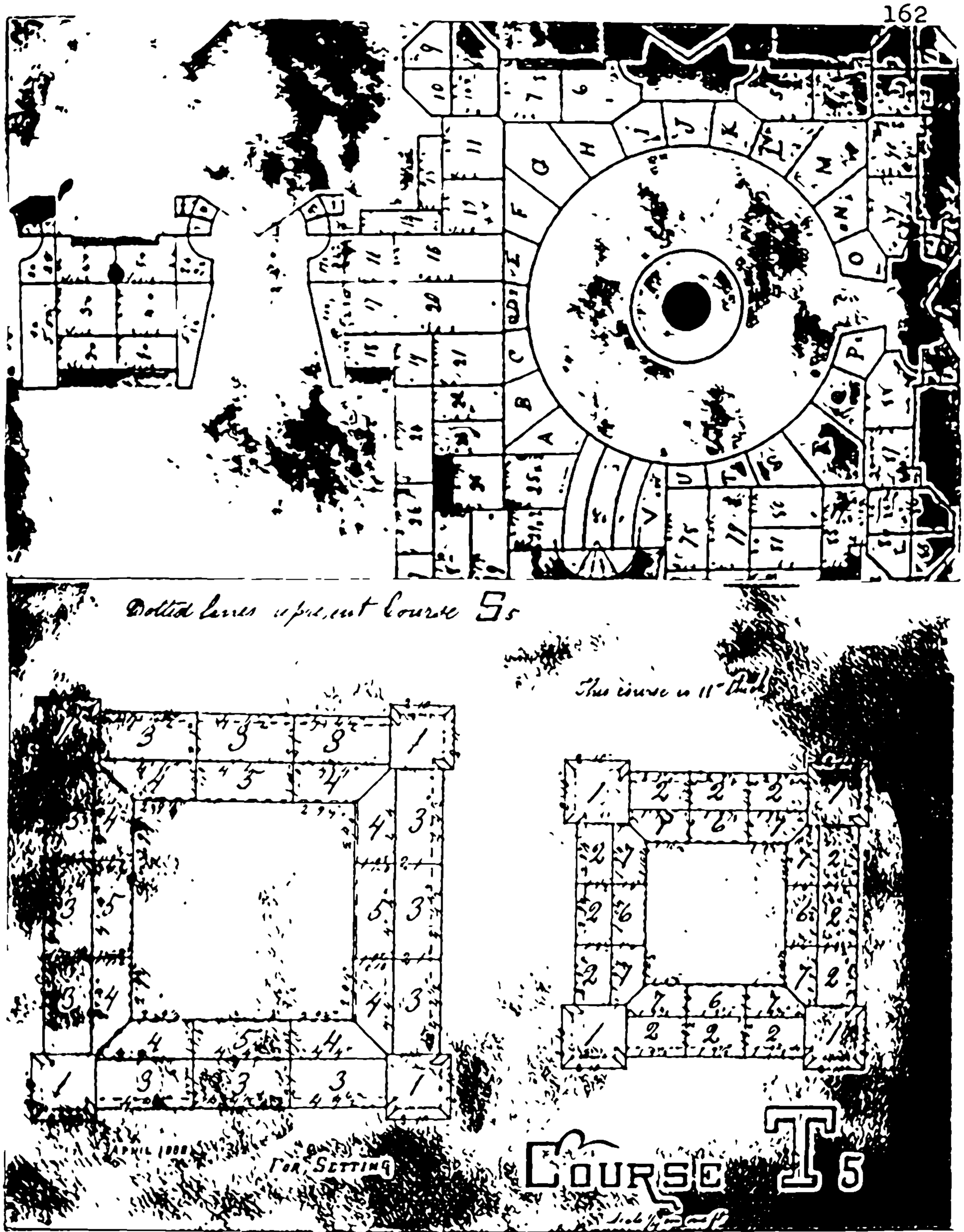
[12]Keith Wilson Wilcox, "An Architectural Design Concept for the Church of Jesus Christ of Latter-day Saints" (unpublished Master's thesis, School of Architecture University of Oregon, 1953), pp. 52-3.

[13]Sheldon Cheney, The New World Architecture (New York: Tudor Publishing Company, 1930), pp. 328-9, cited by Wilcox, p. 67. Regarding the Salt Lake Temple this is evidently true. In many aspects it was a product of good and leisure times, a structure located in the cultural heart of the colony. The other Utah Temples finished in the course of a few years were highly functional in their architectural style.



Architectural Plans -
depicting scale, stone number and position.

L.D.S. Historian's Office.

Though similarities exist, as in any religious edifice, a Latter-day Saint Temple is distinctive from any general classification of church architecture. According to James E. Talmadge, "A Temple is more than a meeting house. . . . It is a place especially prepared by dedication unto the Lord, and marked by His acceptance, for the solemnization of ordinances pertaining to the Holy Priesthood."[14]

The nature of a temple's function is determined by the ordinances solemnized therein. Latter-day Saint Church members believe that these are determined by the President of the Church as revealed by the Lord. The temples of the Church are constructed for these purposes and the important elements architecturally are the aspiring qualities of the edifice which is in harmony with the holy ordinances within.

To classify the Salt Lake Temple in a specific architectural style is very difficult and evidently very subjective. It will be remembered that the general plan has always been prescribed by the Church authorities, men who generally were not too concerned with or familiar with architectural styles. William W. Ward in a letter to the Deseret News in 1892 reported that he did not recollect "any talk between Brigham and Angell in regard to the style of the building. Angell's idea and aim was to make it different to any other

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[14]Talmadge, p. 154.

known building, and I think he succeeded as to the general combination."[15]

In 1856 while serving on a mission to England Truman O. Angell had an engraving made of the Temple. The English architect E. L. T. Harrison obtained one and wrote to Orson Pratt in regard to the architecture:

> Having spent seven or eight years of my life in the midst of designs of every description, in an architect's office, I think it is but justice to Elder T. O. Angell, the Architect, to say, that the building as a whole is a most original conception; and the groupings on the various towers, buttresses, and etc., one of the most harmonious pieces of architectural composition I have ever seen.
>
> The windows, doors, etc., are of the Gothic Style, and what is determined the perpendicular class, used very extensively in cathedral buildings a few centuries ago.
>
> As the Mormons believe getting and combining all that appears to them to be good, the architect has broken through all the dogmatic rules of the world, and introduced in connection with them mouldings and other compositions, peculiar to the Roman or Classic period, so blended as not to offend. But the architect's skill shines most in the happy proportion and combination of the main features. The building will be massive without being over crowded with decoration.
>
> Taken as a whole building, it is not a copy of anything under the sun, so far as I am acquainted. I have looked at the design many times, and feel that it will bear looking at many times more. To one fond of viewing architectural efforts, it is, on account of its originality, a perfect feast, especially in this age so barren in respect to really new architectural designs.[16]

Joseph Don Carlos Young, the Architect in charge during the latter period of construction replied to an inquiry by Talmadge:

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[15] Deseret News, April 16, 1892.

[16] Millenial Star, XVIII, No. 49 (December 6, 1856), 783.

> Questions as to the style of architecture embodied in the great Temple have been asked time and time again. Some prominent architects have classed it as Round Gothic; others have said that it is practically unclassifiable, it being "all material and not at all design." In my judgement it might be classified as the Romanesque modified by the castellated style.[17]

Temple Description.--The Temple as it stands is strikingly similar to the Temple descriptions issued by Truman O. Angell in 1854 and in 1874. The building is symmetrical, the eastern half, except for heighth, being a duplication of the western half, and the northern half, a repetition of the southern. The towers, three on each end, are both vertical and horizontal duplicates of each other, as to parts, not size.

The building is one hundred and eighty-six feet in length and ninety-nine feet in thickness at the sides extending to a maximum width of one hundred eighteen feet six inches including the extensions of the corner towers. The building stands one hundred sixty-seven feet six inches high at the square. The center tower of the west is two hundred and four feet above the promenade while the east center tower, excluding the twelve feet five and one-half inch statue, is

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[17] Improvement Era, XLIII, No. 2 (April, 1943), 246. Mr. Wilcox cites the University Prints as listing the Temple as a Romanesque adaption, and then he comments that it is more contemporary than is normally believed. See Kenneth S. Conant, University Prints, Series G.M. (Newton, Mass.: Garden City Press, 1930), as cited in Wilcox, p. 46.

two hundred and ten feet in heighth. The entire area covered by the building is twenty-one thousand eight hundred and fifty square feet.[18]

The Symbolic Stones.--At the base of the wall in the southeast corner is the record stone, of red firestone quarried in Red Butte Canyon. It measures 3 feet long, 20 inches wide and 20 inches in depth and has a cavity approximately one foot square which holds books, papers, coins and other records of importance. The opening is covered with a sandstone slab which fits snugly into the opening and is sealed carefully to prevent air or moisture from damaging the contents of the stone.

The largest stones in the building are set between the base string course and the first string course. These are the earth stones and the base of each is twenty-eight inches above the promenade. There are thirty-four of these stones, one in the base of each buttress, with the exception of the sixteen buttresses which join the towers to the walls. Each stone weighs over six thousand pounds, contains forty-one cubic feet of rock, measures five feet six inches high, four feet six inches wide and twenty inches in thickness, and has carved

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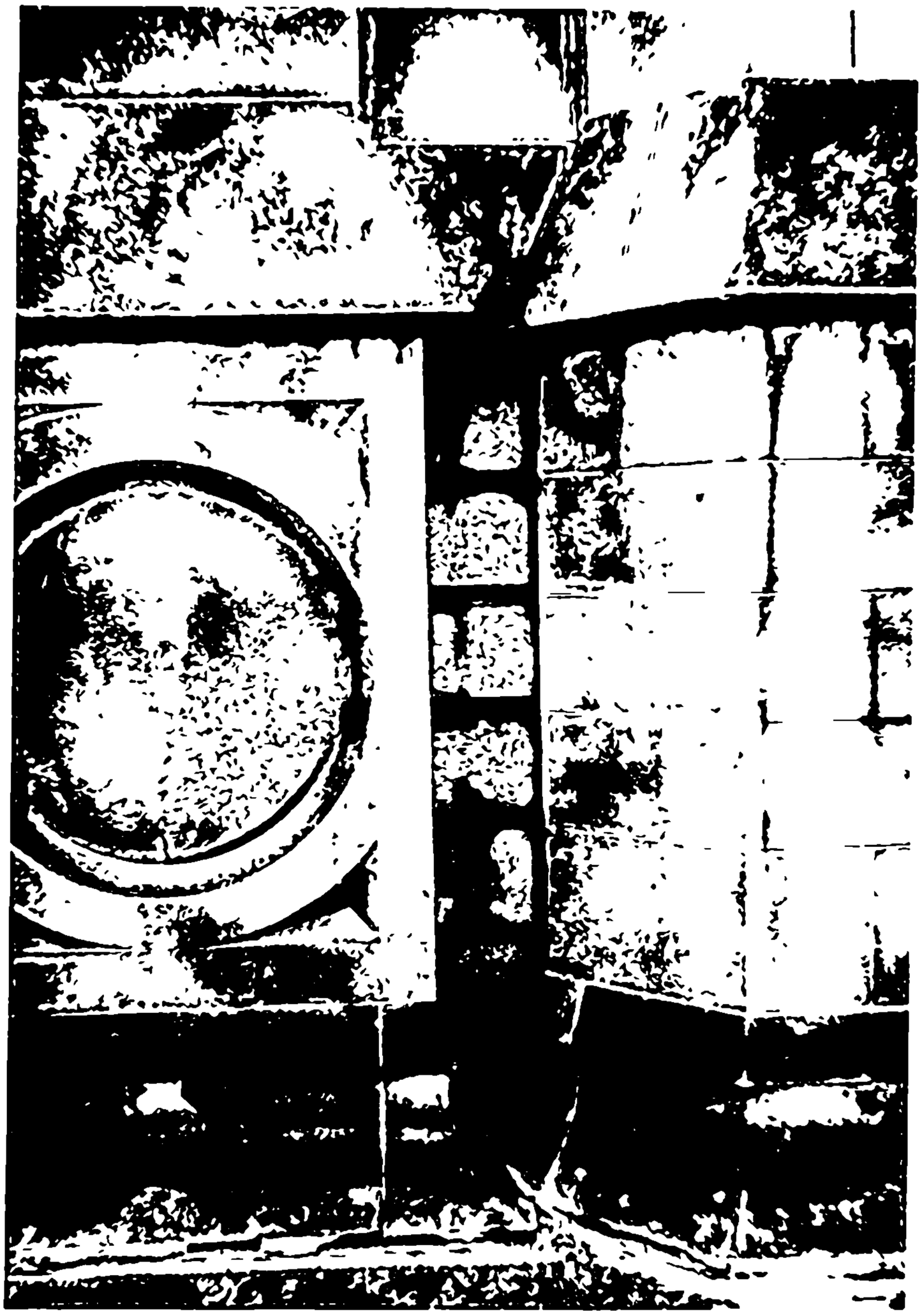
[18]Based upon information from Angell, "Temple Description," Millenial Star, XXVI (May 5, 1874), 273-5, and Talmage, pp. 173-5. For Truman O. Angell's Temple descriptions of 1854 and 1874 see Appendix II.



THE EARTH STONE

This shows the earth stone and the stonework of the first two water tables. The hinge stone which connects the water table on the flat and octagonal buttresses is one of the most difficult stones in the edifice. Note how the mortar joint is staggered from left to right to add strength.

Personal photograph taken July 1, 1960.

in bas relief a globe three feet eleven inches in diameter, representing the earth.[19] The price of each stone including quarrying, transportation and final cutting was approximately $300.00.

The next symbolic stones on the buttresses are the fifty moon stones, set just below the second water table, and even with the top of the first set of oval windows. Each of these stones is four feet seven inches long, three feet six inches wide, twelve inches thick, contains nearly sixteen cubic feet and weighs approximately twenty-eight hundred pounds. Each moon stone is carved to represent the moon in one of its four quarters. Beginning at the southeast corner and moving to the left, the first stone depicts the first crescent new moon, the next buttress depicts the first quarter with well over half of the face of this stone in a polished state and the other half uncut or shaded, the next buttress depicts the moon in its full phase, and the cycle is completed by the next stone which depicts the moon in the last quarter. The crescent in this stone is on the upper surface of the face

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[19]The initial plans called for each stone to represent the earth in orbit, depicting the axis, continents and peninsulas in different longitudinal areas. One drawing located shows North and South America and both of the polar regions. See Temple Plans. Data concerning dimensions, symbolisms, and descriptions have been derived from James E. Talmadge, pp. 177-80; The Contributor, April, 1893, pp. 275-77; James E. Talmadge, The Great Temple (pamphlet [parts are missing], Library, Brigham Young University); Lundwall, pp. 138-9; Personal observations.

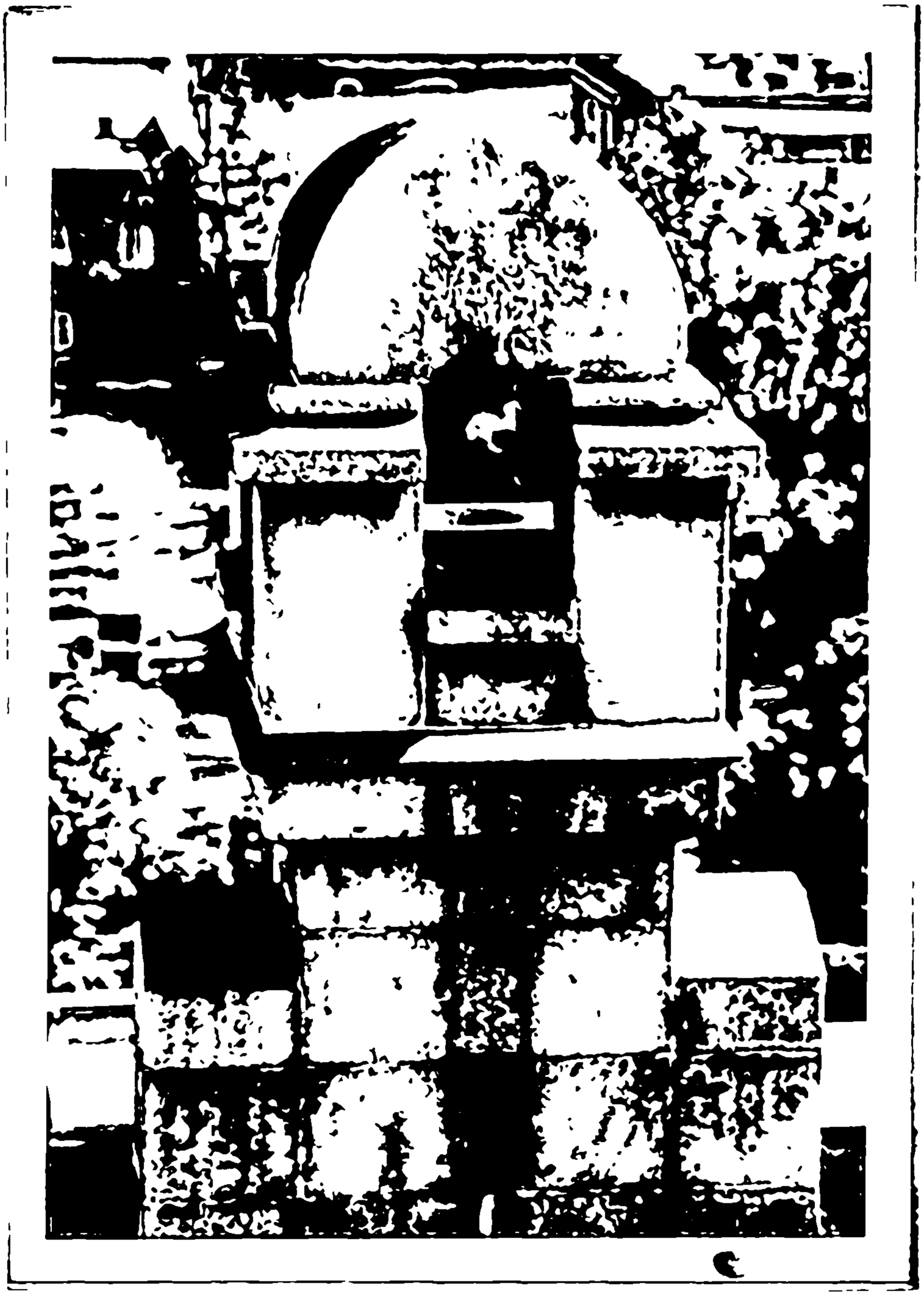
SYMBOLIC STONES
Moon stones, Star stones, Sun stones and the Oolite casings

Personal photograph taken July 1, 1960.

of the stone exactly opposite to the new moon stone. This series of four stones depicting the four phases is consistent until the third buttress on the north wall. At this point the third buttress has a moon stone depicting the first quarter; the next two phases of full and last quarter are omitted and the fourth buttress has a new moon stone. No explanation substantiated by any factual evidence can be cited for this break. The aggregate cost of these stones is estimated to be $7,500.00.

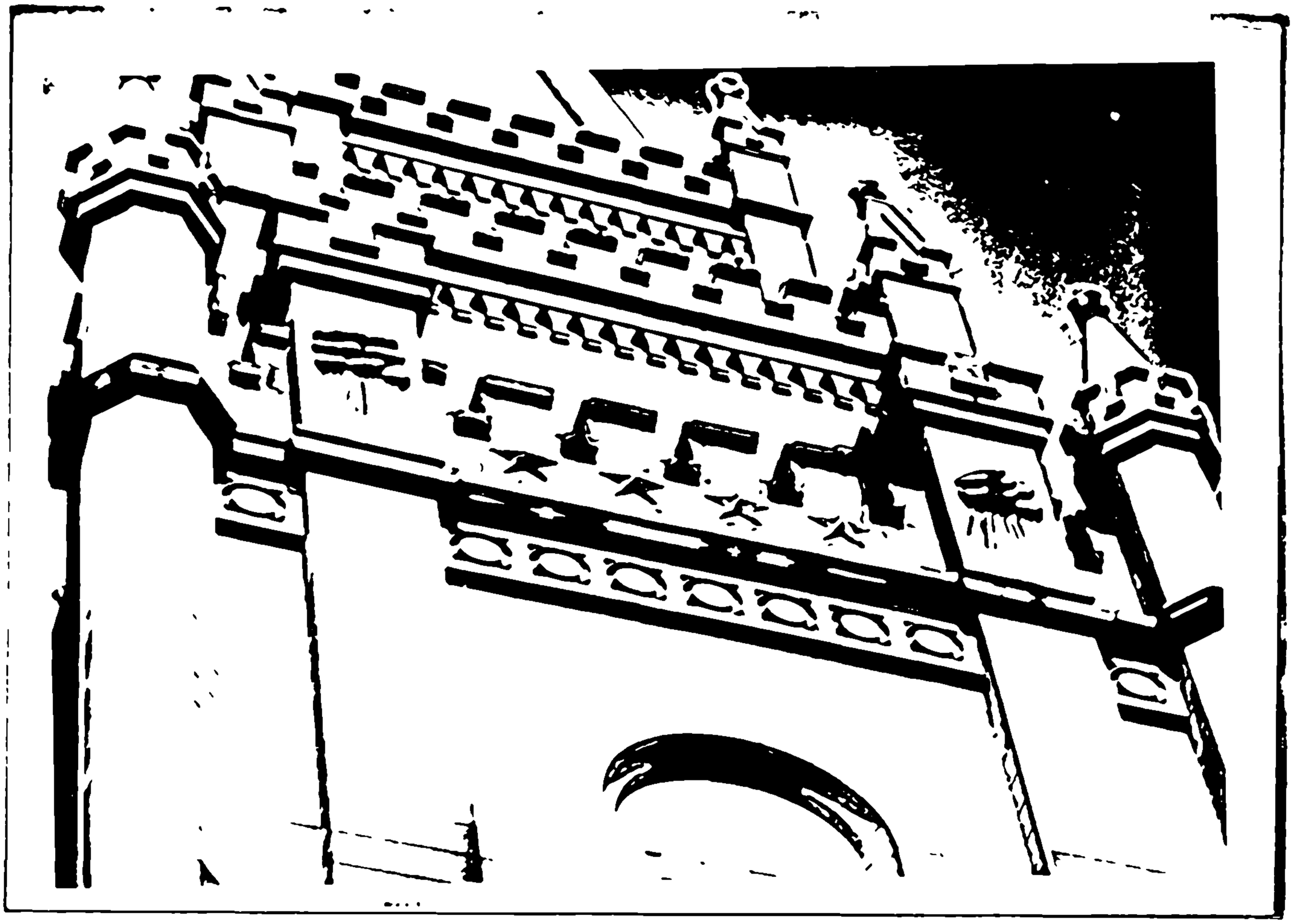
The next stones on the buttresses are the fifty sun stones, located directly below the third water table. Each of these stones is the same length and width as the moon stones but ten inches thick, contains approximately thirteen cubic feet and weighs approximately twenty-four hundred pounds. The moonstone is designed with a serrated edge of fifty-two points bordering the center disc, which represents the number of weeks in the year and it was initially planned to guild the points and to shade the disc area so as to give the stone a golden gleam.

Each of the buttresses has a capstone which forms the parapet of the walls. There are nine of these stones on each side of the building and eight on each tower, making a total of sixty-six. Four of the nine stones on each side wall have hollow shafts eleven inches in diameter which extend into the basement and are used for ventilation purposes. No evidence



BUTTRESS CAPSTONE
This shows the eleven inch ventilation duct and the four side crenels.

Personal photograph taken July 8, 1960.



EAST CENTER TOWER

The unique cloud stones, star stones and Saturn's rings are visible in this picture. There is an obvious difference in the relief of the two cloud stones.

Personal photograph taken on July 1, 1960.

was found to support the popular belief that they were left for heating outlets. These stones at the base are three and one half feet square and weigh nearly three thousand pounds each.

Surmounting each of the octagon turrets is a single spire shaped stone six feet high and three feet wide at the base. The tip of each stone is cut to represent a flaming torch. There are twelve of these stones in each tower, depicting the twelve apostles of the Church. The three towers on the east represent the President of the Church and his two counsellors and stand six feet higher than those on the west which represent the Presiding Bishop and his two counsellors.

Just below the capstones on the two principal buttresses of the eastern tower are the cloud stones which are carved to represent billowing clouds through which rays of light are shining. There are only two of these three thousand pound stones, which measure three and one-half feet by five feet, in the building. This facade is emblematic of the gospel light piercing through the clouds dispelling the clouds of superstition and error which had engulfed the world.

Abundantly found on the building are the one hundred and four five pointed star stones. With the exception of the oval windows and the two long windows in the center towers, the keystone of each of the windows and doors has on its surface one of these stones. It is interesting to note that the single point of each star faces downward on the east and

west ends of the building while on the north and south walls the single point faces upwards. No official word has been given to explain this difference.

Directly below the first parapet on each side of the six towers is an ornamental frieze of separate stones depicting the planet Saturn with its rings. There are one hundred and eighty-four of these stones in the building. Each stone is two by two and one-half feet in size and weighs nearly one thousand pounds.

All of the windows of the building above the basement recede from the face of the wall to the window sash three feet. The architect's original intention was to make these cavetto styled window jambs from stone but instead they were moulded from material analogous to cement and laid in sections. The two large oolite moulded windows in the center tower of the east and west end of the building are inscription windows. The keystone at the top of the arch of each of the four windows is inscribed with the words, I AM ALPHA AND OMEGA, which epitomizes the scriptural message found in Revelation 1:8. "I am Alpha and Omega, the beginning and the ending, saith the Lord, which is, and which was, and which is to come, the Almighty." Below the keystone carved into the oolite at the top of the lower windows are the clasped hands, representing the extending of the right hand of fellowship. On the upper windows, in a similar position is depicted the All-seeing Eye.

The doors at the four principal entries to the buildings are identical. Sixteen steps approach each doorway, the lowest of which is one stone over sixteen feet in length. On either side of the doors is a niche for a statue. These oak doors are eight and one-half feet wide and over sixteen feet high. The upper panels are frosted plate glass protected by bronze grillwork and the doorknob of each door has a beehive with the words, "Holiness to the Lord," inscribed in relief.

The west center tower's principal facade depicts the constellation of Ursa Major, or the Big Dipper. The two pointer stars range as nearly as possible with the North Star and all are carved in alto relieve. The stars' single points are upward and the moral of the constellation is that the lost may find their way by the aid of the Priesthood.[20]

The principal inscription stone on the building is in the facade directly below the first battlement on the east center tower. It consists of five stones and received the finishing touches one day prior to the initial dedicatory services. Inscribed in guilded letters are the words:

HOLINESS TO THE LORD.
The House of the Lord, built by
the Church of Jesus Christ
of Latter-day Saints.
Commenced April 6, 1853.
Completed April 6, 1893.

At the vertex of each tower is a capstone, the upper portion of which is a perfect sphere. The diameter of the

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[20]Talmadge, House of the Lord, p. 24.

WEST CENTER TOWER
The large facade has the constellation of Ursa Major in relief. The detail of the finials and the spire stones, as well as Saturn's rings can all be seen.

Personal photograph taken July 1, 1960.

capstones on the four corner towers is three feet, while the diameter of those on the two center towers is three feet eight inches. These stones are in two sections, with the center part slightly hollowed. The east center capstone serves as a record stone and is the repository for such items as: Bible, Book of Mormon, Doctrine and Covenants, Voice of Warning, Spencer's Letters, Key to Theology, Hymn Book, Compendium, Pearl of Great Price and other books. Photographs of Joseph and Hyrum Smith, Brigham Young, John Taylor, Wilford Woodruff, George Q. Cannon, Joseph F. Smith and the Temple as it appeared in 1892 along with an engraved copper tablet setting forth the principal dates in the history of the building and the general authorities of the Church as sustained in office on April 6, 1853, and as sustained in office on April 6, 1892, the day of laying the capstone, were also placed in the stone.[21]

Ornamental terminals adorn the capstones on all of the towers exclusive of the east center tower. The finials on the four corner towers are ten feet in height while the west center finial is twelve feet in height. They were made of sixteen gauge hammered copper by Samuel Backman of Salt Lake City. These ornaments are fastened into the capstones of

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[21]James E. Talmadge, pp. 177-80; The Contributor, April, 1893, pp. 275-77; Lundwall, pp. 138-9; James E. Talmadge, The Great Temple; Personal observations. All of the measurements, observations and counts were checked for accuracy and many new facts are noted.

the spires by means of iron rods, which reach to an insulating joint, about half way up the interior of the finials, and are counter balanced by iron weights. The inside of these towers is inaccessible at the present time and thus it is impossible to describe the exact suspension system utilized. These ornaments were initially gilded in gold leaf and each was illuminated with eight one hundred candlepower incandescent lamps.[22]

Surmounting the east center spire is the statue of the Angel Moroni which stands twelve feet five and one-half inches high and was sculptured by Utah-born Cyrus E. Dallin. It was constructed in Salem, Ohio, is made of twenty-four gauge hammered copper and heavily gilded with gold leaf,[23] and weighs approximately fifteen hundred pounds.[24] The statue is representative of the scriptural passage[25] which Mormons believe was fulfilled when Moroni, a resurrected leader of Book of Mormon times, appeared to Joseph Smith on September 21, 1823.

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[22]Report by John Nicholson, Clerk of the Conference of April 6, 1892, Journal History, April 6, 1892; Interview with Lynn Millgate on May 11, 1959.

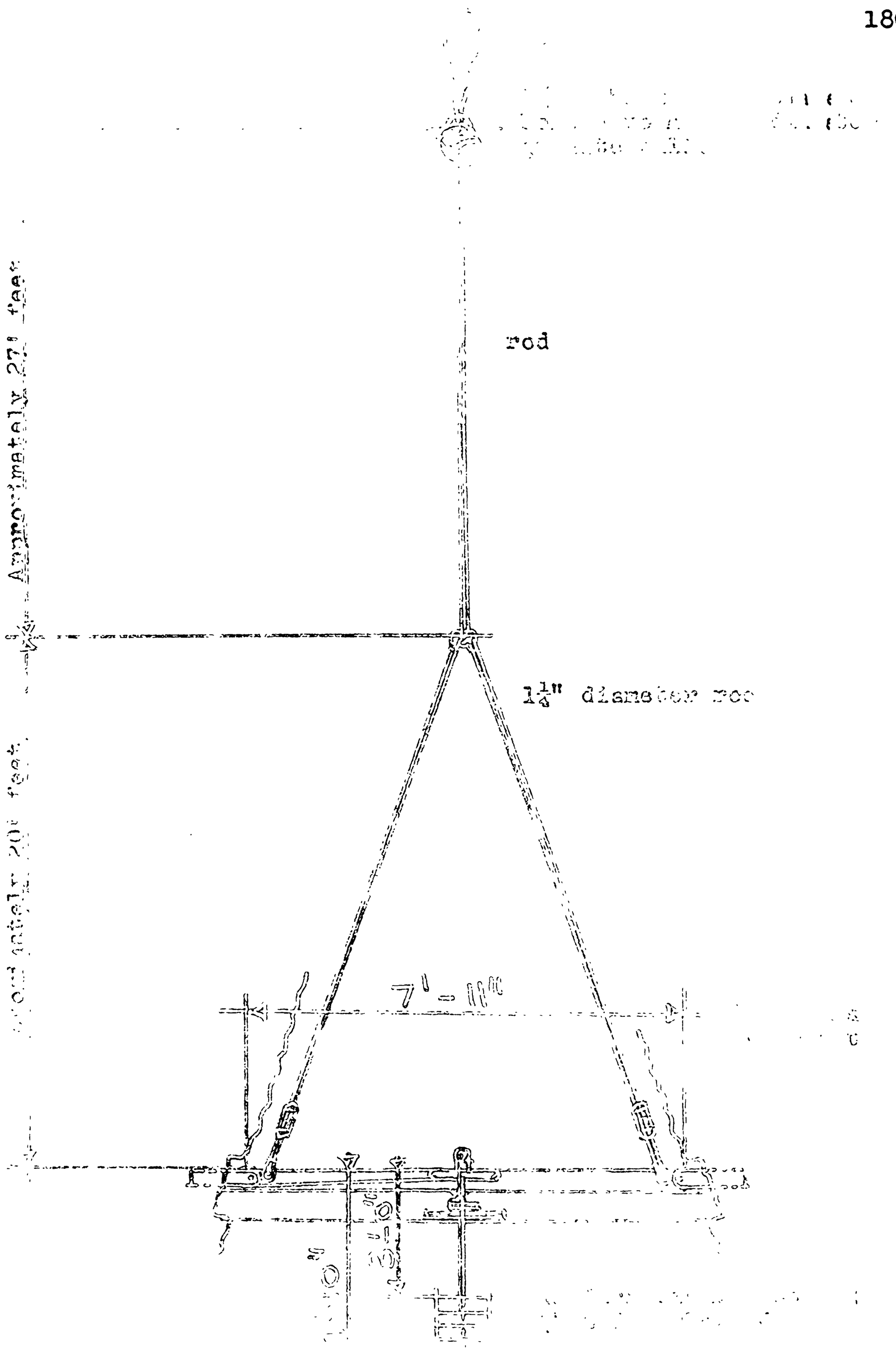
[23]The Contributor, p. 274.

[24]Journal of Wilford Woodruff, No. 12, March 28, 1892.

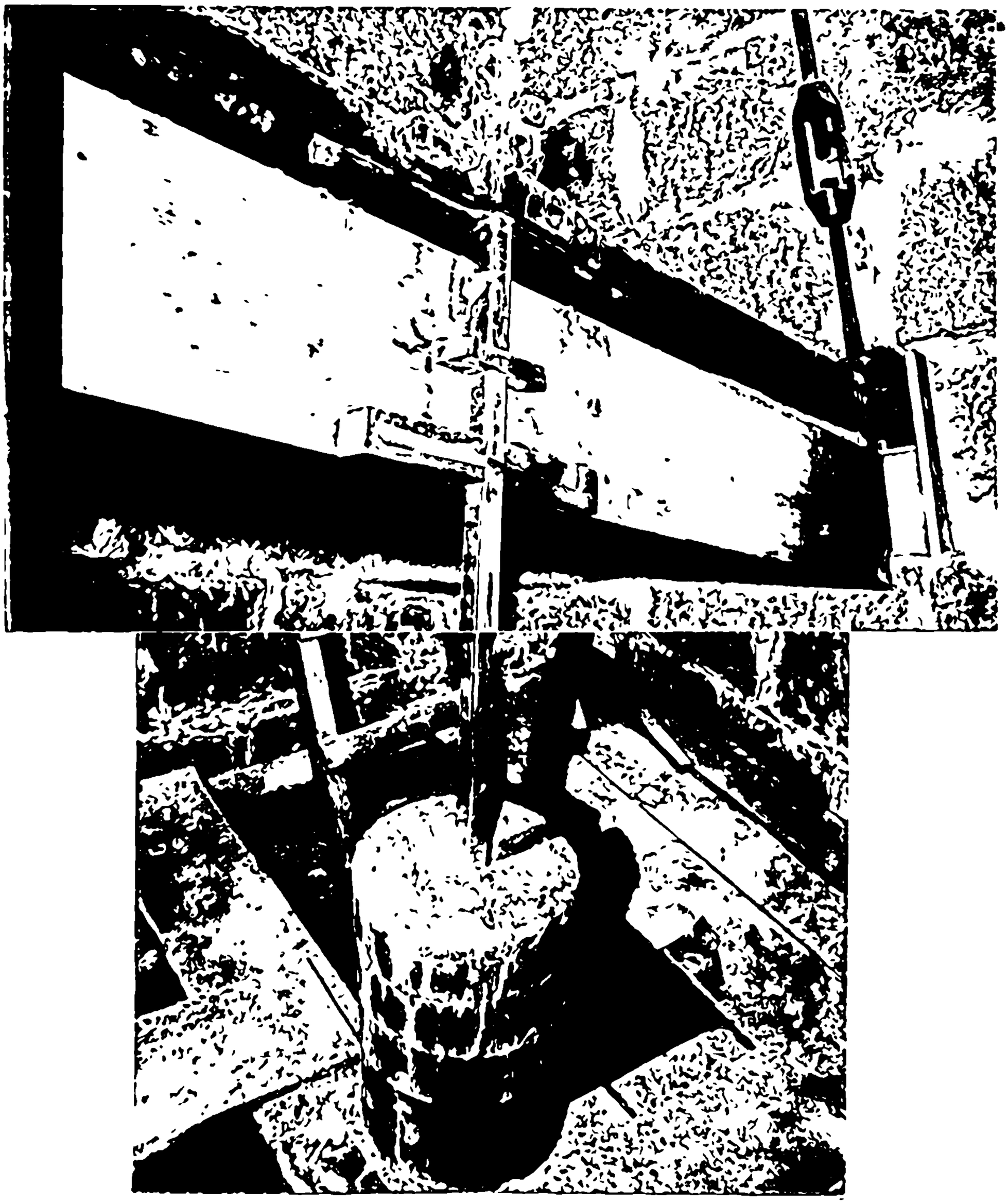
[25]Rev. 14:6-7. See also, Joseph Smith (trans.), The Pearl of Great Price, Writings of Joseph Smith, II, 30-48 (Salt Lake City, Utah: The Church of Jesus Christ of Latter-day Saints, 1953 ed.).

> And I saw another fly in the midst of heaven, having the everlasting gospel to preach unto them that dwell on the earth, and to every nation, and kindred, and tongue, and people,
>
> Saying with a loud voice, Fear God, and give glory to Him; for the hour of his judgment is come; and worship him that made heaven, and earth, and the sea, and the fountains of waters.

The suspension system for the Moroni statue is most unique. A steel rod approximately two inches in diameter extends from the statue into the cone of the tower for approximately twenty-seven feet. Two anchor rods one and one-fourth inches in diameter extend from this point downward approximately twenty feet to each of the two sides of the leverage arms which are about four feet long and one inch thick and are set into the walls of the towers. The base of the arm is four inches tapering to two and one-half inches at the lever. Each arm is connected to the wall by one large bolt, providing the swivel movement for the anchor rods. The two leverage arms are joined in the center and attached thereon is a steel rod with a wooden facing for marking. This rod is one inch square and three feet long and at the lower end has five iron weights which measure twelve inches in circumference, four inches in thickness and have a combined weight of well over four hundred pounds. This counterweight serves to steady the statue and the slightest sway in any direction is greatly dissipated by the leverage action of



Fetzer & Fetzer, A.I.A.
Salt Lake City.



SUSPENSION SYSTEM FOR THE ANGEL MORONI

Personal photograph taken July 8, 1960.

SUPPORT TIMBERS

This picture was taken in the east center spire and depicts the support timbers which lead to the base of the finial spire and terminate 15 feet below the Angel Moroni suspension system.

Personal photograph taken on July 8, 1960.

the system.[26] As to its practicality and over-all engineering effectiveness, the statue has withstood ninety mile hurricanes, nearby explosions and the tumults of nature for over sixty-five years.

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[26]Personal interview with Lynn Millgate. Personal observations and measurements throughout March and April of 1960.

CHAPTER VIII

COMPLETION AND DEDICATION

With the relinquishment of the Temple title by the United States government receiver in 1888, work proceeded unabated until the time of the dedication. The roof was privately contracted by a local firm which was to furnish all labor and material for the project while the expenses were to be paid by the Church with a percentage above cost as the commission.[1] The roof has an approximate pitch of sixteen feet from the apex to the side of the walls. The steel framework was covered by a tin coated sheet iron material.[2]

The framework of the towers is made entirely out of wood. These support timbers are two by twelves bolted together to make each girder twelve inches square. It appears as if the wood has been soaked in some type of preserving solution to control rot and decay.[3]

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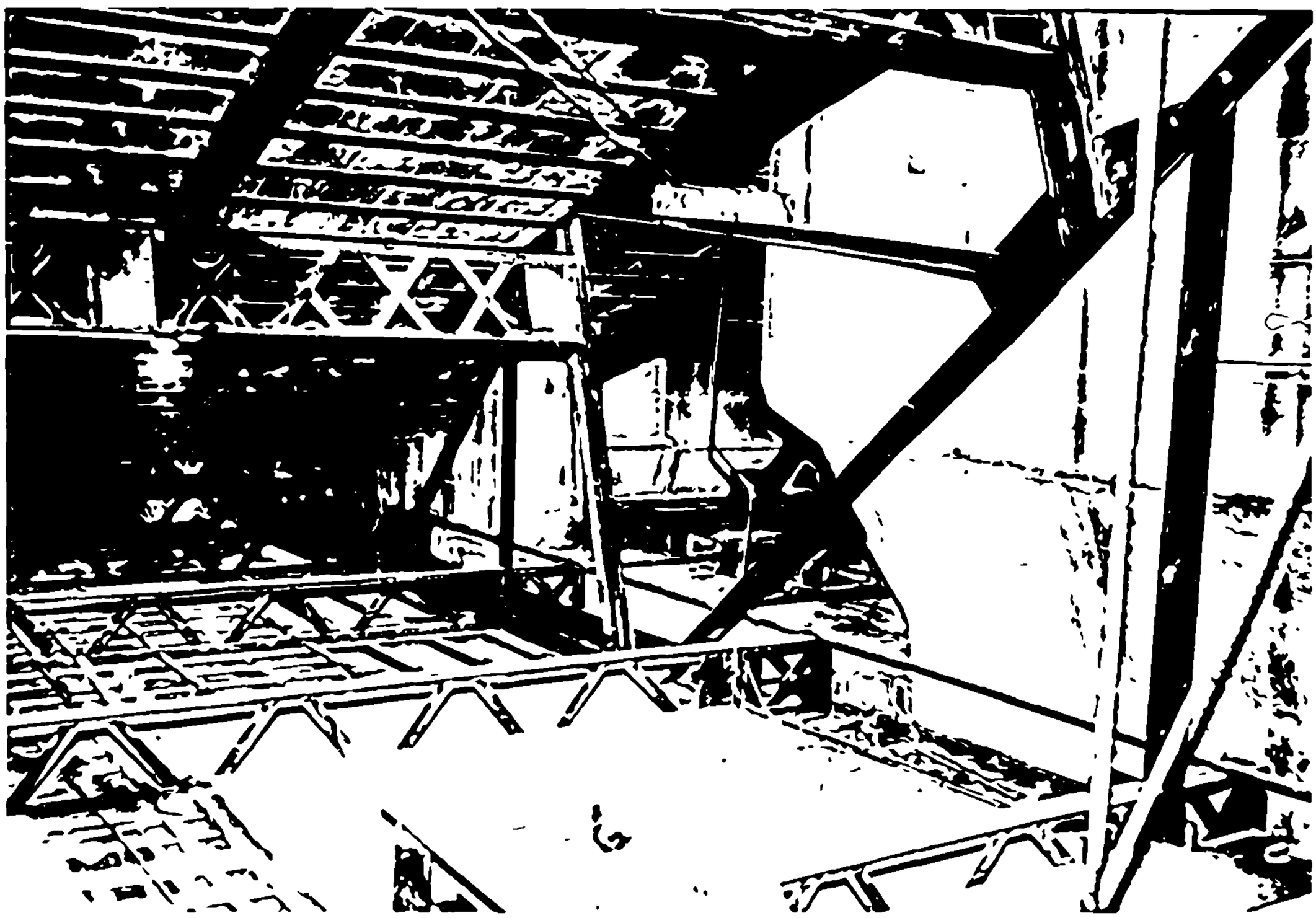
[1]Nuttall, Vol. 2, p. 373.

[2]Interview with Robert D. Young, March, 1959. Mr. Young is the former president of the Salt Lake Temple. The Deseret News for August 15, 1889, reported that tile was being laid on the roof and that soon cement would be laid and then the tin.

[3]Personal observation. Don Carlos Young states that his father informed him that most of the wood used for support positions was soaked for thirty days in a lime-water solution. Interview, February 7, 1960.



STEEL SUPPORT

This photograph was taken in the northeast corner of the Temple attic and depicts the structural support of the roof.

Personal photograph taken on July 8, 1960.

Charles Livingston was appointed Superintendent of the Temple Block shortly after the death of James Moyle in December, 1890.[4] During the October Conference of 1891 the people passed a resolution that the Temple be completed and dedicated by the April Conference of 1893, and John R. Winder was placed in charge of the over-all task. Though architect and foreman alike declared that it would be impossible to obtain material of the requisite kind, Winder stood upon his platform, "It must be done: the Temple must be finished on time for its dedication at the end of forty years."[5]

As conference convened on April 3, 1892, a great deal of fervor swept the 60,000 people assembled around the Temple. Instructions were given on the "Hosanna" shout[6] and President Wilford Woodruff spoke to the congregation in the Tabernacle about the sacredness of the occasion. The priesthood of the Church was arranged in order and at 11:30 A.M. marched to the Temple site, where a platform had been erected south of the southwest corner for the authorities. The Tabernacle choir

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[4]The Contributor, p. 270.

[5]Address by President Seymour B. Young, Conference Report, April 3, 1893, p. 19. L.D.S. Historian's Office.

[6]The "Hosanna" shout is mentioned often in the Bible. See Matt. 21:9-15 and Mark 11:9-10. The shout is reserved for great occasions and had been used in all of the previous L.D.S. Temple dedication services. It is a shout of "Praise and Gladness to God." See B. H. Roberts, Outline of Ecclesiastical History (3rd ed.; Salt Lake City: Deseret News, 1902), p. 359.

occupied a platform to the left of the main stand. The "Capstone March" was played by Held's band, after which the "Temple Anthem" was rendered by the choir. The dedicatory prayer was offered by President Joseph F. Smith followed by the choir's "Grant Us Peace." At this moment Architect Don Carlos Young called from the top of the Temple, "The capstone is now ready to be laid." Just as the hour of noon approached President Wilford stepped to the front of the platform. His manner was most impressive, his voice clear when he said,

> Attention all ye house of Israel, and all ye nations of the earth! We will now lay the top stone to the Temple of our God, the foundation of which was laid by the Prophet, Seer and Revelator, Brigham Young.[7]

President Woodruff pressed an electric button which lowered the capstone into position[8] and a moment later the architect signalled that the capstone was in place. Then, as if the voice of one, some 60,000 people raised their voices and shouted "Hosanna! Hosanna! Hosanna! to God and the Lamb. Amen, Amen, Amen!" This was repeated three times accompanied by the waving of white handkerchiefs and followed by the singing of "The Spirit of God Like a Fire Is Burning." The ground trembled with the volume of sound, which was multiplied

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[7]Deseret Evening News, April 6, 1892.

[8]It was initially intended for President Woodruff to guide the capstone into position from the top of the spire. The five hundred voice choir was to sing the prepared ode from a special platform erected at the top of the spires. Fearing an accident, this plan was abandoned. See Deseret News, April 14, 1892.

again and again by the repetition of its echoes in the surrounding hills. After this, the Union Glee Club sang "The Temple Ode," composed by H. W. Naisbitt. Francis M. Lyman, one of the Twelve Apostles proposed that out of deference for President Woodruff's wishes to live to see the Temple completed by April 6, 1893, and believing the President's counsel to be the word of the Lord, the assemblage pledge themselves individually and collectively to finish the Temple by that date. The resolution was adopted unanimously. The choir sang "Song of the Redeemed," and George Q. Cannon offered the benediction. After the ceremonies the task of placing the statue of the angel Moroni in position was commenced. It was unveiled at 3:10 P.M.[9] standing majestically balanced on one foot, with its crown 222' 5" above the ground.[10]

The ensuing year was one of great anxiety and accomplishment. In every department maximum effort was exerted to hasten the completion of the Temple. A boiler house was constructed about three hundred feet north of the northwest corner of the building and a huge expansion tank was installed in the Temple attic to distribute the steam for heating.

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[9] Ibid., April 6, 1892.

[10] Deseret News Weekly, April 8, 1893. Several of the early drawings represent the angel in a flying position on both the east and west towers in harmony with the scripture (Rev. 14:6-7) and the angel on the Nauvoo Temple. See Daniel Tyler, "Temples," The Juvenile Instructor, XV (October 15, 1880), 229.

Four engines, two seventy-five horsepower generators and two twenty-five horsepower generators were installed to four Edison dynamos, which furnished enough electricity to light the Temple, the Tabernacle and the Assembly Hall.

One hundred feet north of the Temple is the Annex. This building is made of oolite and was designed by Don Carlos Young. It was begun on May 1, 1892, and was completed on April 5, 1893. The Annex serves as an office and reception center for Temple officials and those entering the Temple for ordinance work.[11]

Almost daily the First Presidency visited the Temple to check the progress and to exhort the workers. Carpenters, plasterers, plumbers, machinists and many other craftsmen were employed under contract. Carpets, tapestries, chandeliers and other glass products had to be selected, many of them imported, and placed in the building. Work continued unabated until the last moment. On April 5, 1893, the Annex and the Temple were completed and the carpenters were released.[12]

As April 6 drew near, enthusiasm increased among the Mormon people. This was the crowning achievement, the culmination of hopes, dreams, sacrifice and prayers, the fulfillment of a prophecy, a day in which their Lord would surely be pleased.

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[11] The Contributor, pp. 282-3.

[12] Nuttall, Vol. 4, p. 525.

In the forty years since the ground-breaking ceremonies, death had called most of those who had begun the work. President Young, President Grant, the Presiding Bishopric, the Seven Presidents of Seventies, the three superintendents, the Church Architect and hundreds of the faithful workers had passed away. Among those still living who had officiated in the initial services were Wilford Woodruff, George Q. Cannon, Lorenzo Snow and George B. Wallace. Others included Jesse W. Fox, Sr., who had surveyed the site; Alonzo H. Raleigh, Temple foreman until 1858; Nathan Davis, master mechanic in 1853; Peter Gillespie, whose employment as a stonecutter dated back the farthest of any then living; Eugene B. Fullmer, who helped to dig the foundation and in the aggregate cut and finished more stones than any other individual; Elias Morris, who laid the first granite blocks in the building and Zachariah T. Derrick, who labored as the pattern maker from 1855 until the day of completion.[13]

Conference convened on April 4 in the Tabernacle. A large number of the sermons dwelt on the subject of preparation before entering into the Temple. Each member of the Church was to have a recommend from his bishop declaring him a member in good standing and worthy to enter. Since only two thousand one hundred and fifty people could be accommodated at each

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[13]Albert J. Zobell, Jr., "Here and There in Temple History," Improvement Era, XLVI (April, 1943), 249.

dedicatory session, apportionment was made to each stake of the Church.[14]

April 6 was a cloudy and stormy day. A wind approaching hurricane force was blowing as the venerable Wilford Woodruff and all of the general authorities entered the southwest door of the Temple and joined twenty-five hundred members of the Church to dedicate the House of the Lord. A selected choir of three hundred voices, led by Evan Stephens, sang, "Let Israel Join and Sing." A beautiful prayer was then offered by President Woodruff in which he thanked the Lord for the blessings showered upon the saints and sought the guidance of the Lord in the work to be done in the Temple. The various parts of the Temple were dedicated and consecrated and formally presented to the Lord.[15] The "Hosanna!" shout was then given three times. The choir sang the "Hosanna Anthem" and the congregation joined in singing the hymn, "The Spirit of God Like a Fire Is Burning." President Wilford Woodruff then spoke and was followed by Joseph F. Smith. The anthem, "Arise ye Saints," was sung by the choir and the benediction was offered by Apostle Lorenzo Snow.

Dedication services were repeated until all those who desired had an opportunity to experience the spirituality

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[14] Deseret News Weekly, March 25, 1893.

[15] The full text of President Woodruff's dedicatory prayer can be found in Lundwall's Temple of the Most High, pp. 126-36.

of the occasion. The closing session was held on Monday, April 24. Thirty-one services provided opportunity for eighty-two thousand people to participate in presenting their Temple to their God.[16]

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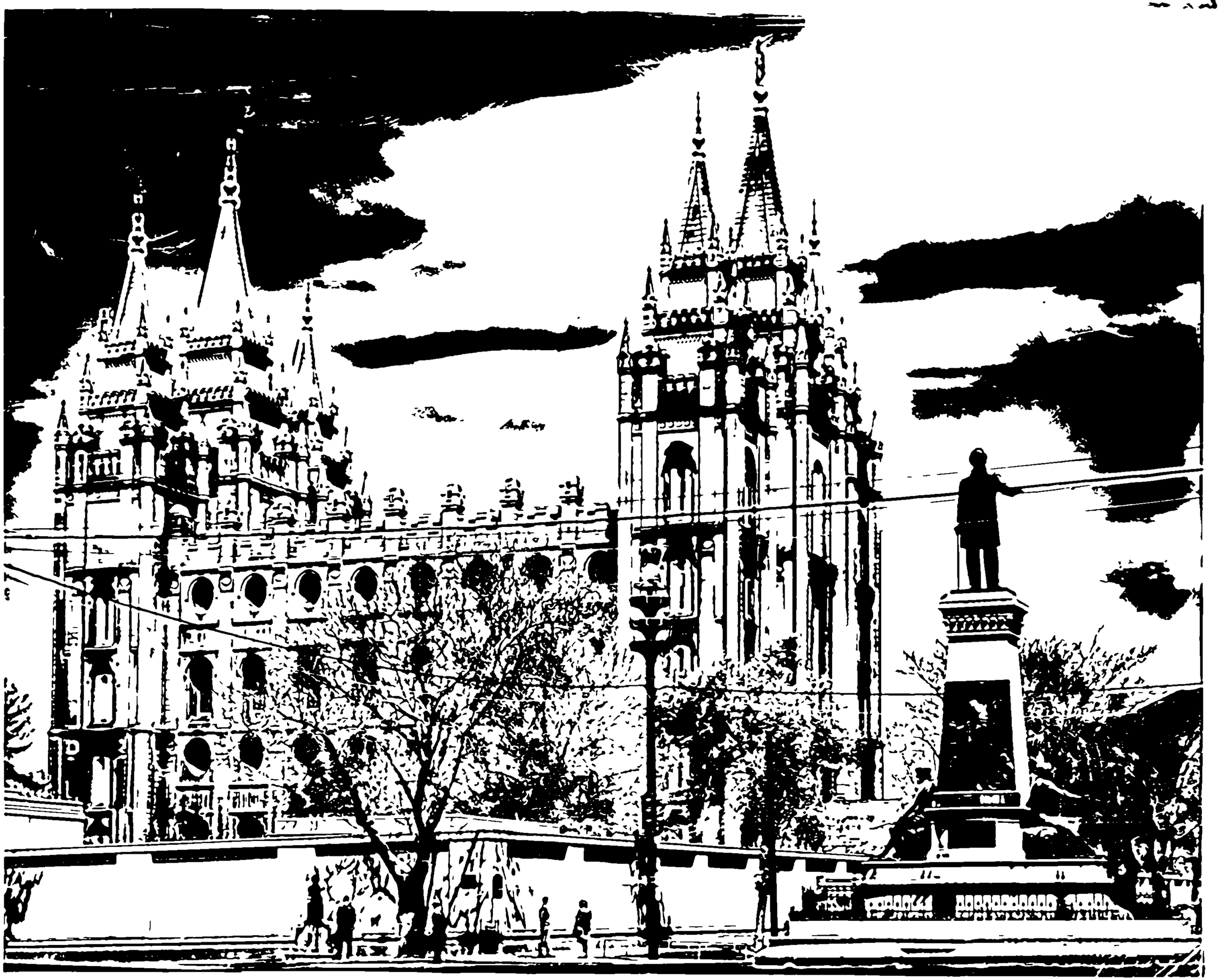
[16]Deseret News, April 6, 1893; The Contributor, pp. 292, 301; James E. Talmadge, House of the Lord, pp. 158-71.



THE MONUMENT TO THESE LABORS

APPENDICES

APPENDIX I

BIOGRAPHIES OF KEY TEMPLE BUILDERS

TRUMAN OSBORN ANGELL

Truman O. Angell was the fifth of ten children of James and Phebe Morton Angell. He was a direct descendant of Roger Williams and Thomas Angell. He was able to attend school only two years as his father temporarily left home and most of the farm work became Truman's responsibility.

At the age of twenty-three he married Polly Johnson. Truman, Polly, and Phebe Morton Angell were all baptised Latter-day Saints shortly after the marriage.

In 1835 the Angells moved to Kirtland, Ohio, to join the body of the saints. The day after their arrival, a meeting was held in the unfinished Temple and Angell, a skilled joiner, was given a work assignment. His outstanding work attracted the Prophet and Angell was put in charge of finishing a section of the temple, including the stands. He was also asked to supervise other structures being built in Kirtland.

When the Mormons were driven from Kirtland, Brother Angell, his wife, and two daughters left for Far West, Missouri, where the new headquarters of the Church had been established. Upon departure he had only fifty cents, a rickety carriage, and a broken down horse. By borrowing $5.00 from a fellow saint he was able to purchase a better horse. This horse he traded, upon arrival at Far West, for ten acres of ground. Three days later, as a result of mob action, he was forced to abandon his family and new farm and he fled across the Mississippi to Quincy, Illinois where the settlers had compassion for Mormon refugees. Seven weeks later Polly and the two girls arrived. The family went to the Will Travis farm, where they spent two years. Then they moved up the river fifty miles to Nauvoo. There Angell worked incessantly on the Nauvoo Temple. The main body of Saints left Nauvoo in December, 1845, but Angell remained until April, when the Temple was completed and dedicated to the Lord.

It was late summer when Truman Angell and family, now four children, left Nauvoo for Winter Quarters. In Winter Quarters, they had one new baby which died along with two of the other children.

Angell was one of the Saints chosen to come west with the first pioneer band. Soon after his arrival in Salt Lake he was chosen as the Church architect. In this calling buildings of every description were placed in his charge. He was the architect for the Council House, Lion House, Beehive House, State House at Fillmore, Salt Lake Temple and many more public and private buildings. He was consulting architect for the St. George, Manti, and Logan Temples.

Truman O. Angell died on October 16, 1887, at his home in Salt Lake City. Except for brief periods of illness, Brother Angell had served faithfully as Church Architect for approximately thirty-five years. At his funeral services Daniel H. Wells said, "Brother Angell needs no monument at his grave, for as long as the Salt Lake Temple stands, that is monument enough for him."[1]

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[1]Wendell J. Ashton, Theirs is the Kingdom (Salt Lake City: Bookcraft Company, 1945), pp. 49-156.

JAMES C. LIVINGSTON

James Campbell Livingston was the son of Archibald and Helen Livingston. He was born on December 2, 1833, at Scot's Ironworks, Lardarkshire, Scotland. He was the eldest of six children and at the age of fifteen became an orphan.

In the spring of 1853 Livingston was baptised a member of the Latter-day Saint Church. He immediately immigrated to Utah and arrived at Salt Lake City on October 16, 1853. His first work was for Brigham Young on City Creek Canyon road. Three weeks later he went to work at the mouth of Red Butte Canyon quarrying rock for the wall around the Temple Block.

On June 7, 1854, Livingston married for the first time. In 1862 he took a second wife, and in 1873 he married for the third time.

Livingston engaged in contracting for some time. He took a contract to cut and pile cord wood for Johnston's army while they were in Utah. Livingston also contracted the building of a canyon road to American Fork Canyon for the Woodmansee Brothers. His time was occupied in this manner until 1860 when he was asked to supervise the quarrying of granite for the Temple near Little Cottonwood Canyon. The quarry operated a few months every year until 1867 when most of the men were called to work on grading the railroad.

In 1863 he served as an agent for Brigham Young. His assignment was to become familiar with the officers and men at Camp Douglas and report military information to Brigham Young.

In 1868, while working under Bishop Sharp on the railroad at Promontory Point, Utah, Livingston was involved in an explosive accident in which he had his right hand and arm blown off. After this he had an artificial limb and hook.

In 1870 he was again asked to superintend the work at the granite quarry. He had complete charge of the quarry from 1860 until 1893. His last task at the quarry was getting out the granite for the Brigham Young monument in Salt Lake City.

James C. Livingston died in 1909, having until the end of his life fulfilled the callings of the Church.[1]

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[1]Dictated life of James Campbell Livingston. Typewritten copy in the possession of Mr. William Kuhre, Sandy, Utah.

JOHN SHARP

John Sharp was born November 8, 1820, in the Devon Ironworks, Scotland, and was sent into a coal pit to work when only eight years old.

He was working as a coal miner in Clackmananshire in 1847 when William Gibson, one of the first Scotch elders sent out to preach, contacted him and converted John and his two brothers to Mormonism. In 1848 the three brothers left Scotland for America.

John arrived in Salt Lake City in 1850. His first work in the valley was in the Church Quarry, getting out stone for the Old Tabernacle and the Tithing Office. Later he was made superintendent of the Quarry. The difficult work of obtaining stone for the foundation of the Temple, the massive wall around all of Temple Block, and the Temple granite was all accomplished under his direction.

He became Bishop of the Twentieth Ward in 1854. This ward progressed under his leadership until it became known as one of the most liberal and intellectual wards in the city. In 1864 Bishop Sharp was appointed assistant superintendent of Public Works and he served as superintendent during the years Daniel H. Wells was serving as head of the missions in Europe.

Bishop Sharp became a subcontracter, under Brigham Young in 1867, for the Union Pacific Railroad. They did the heavy stone work of the bridge abutments and cut the tunnels of Weber Canyon. Later, during a strike between the Union Pacific and the Central Pacific, Bishop Sharp took a contract for Sharp and Young on the Union Pacific. In the difficulty of settlement between Brigham Young and the Union Pacific Company, John Sharp and two other men made a trip to Boston where they obtained $600,000.00 worth of the Company's materials--iron, rolling stocks, and other railroad materials which were used in the construction of the Utah Central Railway.

In 1871 Bishop Sharp became superintendent of the Utah Central Railway and in 1873 he became its president as well. Later he became a director of the Union Pacific lines.

John Sharp died in Salt Lake City on December 23, 1891.[1]

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[1]Andrew Jenson, Latter-day Saint Biographical Encyclopedia (Salt Lake City: Andrew Jenson History Company, printed by the Deseret News, 1901), I, 62-66.

DANIEL HAMMER WELLS

Daniel Hammer Wells was born in Trenton, New York, October 27, 1814. He was the son of Daniel Wells and Catherine Chapin. Both parents were members of outstanding New England families. Daniel H. lost his father when he was only twelve years old and six years later his family moved to Ohio and then to Illinois.

In Illinois, they settled in a small town called Commerce, which later became the "Mormon" city of Nauvoo. Here he was much respected and was called "Squire Wells." He was known for his strict integrity, high sense of justice, and impartiality. He frequently acted as mediator for quarreling neighbors or families. When the Saints arrived in Commerce, after fleeing from Missouri, he aided them in securing a good welcome and land on which to build homes. He was quite an important property holder, and sold city-lots to poor and persecuted Saints at very low prices and on the "installment plan." This endeared him to the Latter-day Saints. He also sold them the piece of land on which the Nauvoo Temple was constructed. He was a close friend of Joseph Smith, an alderman, and a member of the Nauvoo City Council, a regent of the University and a brigadier-general in the Nauvoo Legion. When the Mormons were oppressed he sided with them and encouraged the local people to accept them. However, he did not join the Church until most of the Mormons had left Nauvoo, and the remaining ones were most heavily oppressed.

He settled his affairs in Nauvoo and came to Utah with the second group of pioneers, acting as aide-de-camp to President Brigham Young. When Great Salt Lake City was laid out Daniel Wells drew a lot in the Eighth Ward but President Young wanted him nearer his dwelling so Brother Wells moved to a lot on the east side of Eagle Gate, and subsequently to the land east of the Deseret News office, where he occupied some small adobe houses.

He had seven wives (six of whom survived him), by whom he had thirty-seven children. Of these thirteen sons and eleven daughters survived him.

Daniel Wells was six feet tall; he had prominent features which gave him a striking appearance but his manner was always unassuming. He had a powerful living testimony of the gospel--he never doubted it and never feared to face the opposition of its enemies.

Daniel Wells played a leading role in Indian affairs and his cool headedness, fearless character, and executive

talent were exhibited in such a way that he won unfading renown among the Mormon people. He was a member of the legislative council in the Territorial assembly, and was one of the framers of the constitution for Utah's Statehood. He was appointed second counselor to President Brigham Young, January 4, 1857. He was the superintendent of public works until 1864. Twice he was sent to Europe to serve as head of all the mission there, and he presided over the emigration. He served as mayor of Salt Lake City from 1866 until 1876. He served as President of the Manti Temple from 1888 until shortly before his death on March 24, 1891.[1]

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[1]Andrew Jenson, Latter-day Saint Biographical Encyclopedia (Salt Lake City: Andrew Jenson History Company, printed by the Deseret News, 1901), I, 62-66.

WILLIAM HARRISON FOLSOM

William Harrison Folsom, born March 25, 1815, at Portsmouth, New Hampshire, was very mechanically inclined. At the age of 16 he had shown such ability that his father, a contractor, had William in charge of 500 men working on the docks of Lake Erie.

He arrived in Salt Lake City, October, 1860, as a Mormon and immediately opened a carpenter shop on Main Street. At the October Conference of 1861, he became architect for the Church. Truman O. Angell was forced to resign from this position temporarily because of ill health. William held the position until 1867 and was then retained as assistant architect to Truman O. Angell. For some time Mr. Folsom was superintendent of work on the Salt Lake Temple.

Some important buildings for which he is responsible are the Manti Temple, the Salt Lake Theatre, old City Hall, the original Z.C.M.I. building, and the Salt Lake Tabernacle (Henry Grow assisted on this building).

Mr. Folsom died March 20, 1901.[1]

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[1]Kate B. Carter (comp.), Heart Throbs of the West (Salt Lake City: Daughters of Utah Pioneers, 1941), III, 71-2.

JAMES MOYLE

James Moyle was the son of John Rowe Moyle and Phillipa Beer. He was born in Rosem, County of Cornwall, England, October 31, 1835. Both paternal and maternal grandfathers were commissioned officers in the British Army.

Mr. Moyle took charge of the builders and stone cutters on the Temple Block in 1875. He kept this position until 1886 when he was made general superintendent of works on the Temple Block. He fulfilled this calling to the entire satisfaction of everyone concerned and was held in the highest esteem by the one hundred to one hundred and fifty men under his control.

Mr. Moyle died in Salt Lake City, Utah, on December 8, 1890.[1]

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[1]Andrew Jenson, Latter-day Saint Biographical Encyclopedia (Salt Lake City: Andrew Jenson History Company, printed by the Deseret News, 1901), I, 776-8.

APPENDIX II

TRUMAN O. ANGELL'S DESCRIPTIONS OF THE TEMPLE

TEMPLE DESCRIPTION--1854

The Temple Block is forty rods square, the lines running north and south, and east and west, and contains ten acres. The center of the Temple is one hundred and fifty-six feet six inches due west from the center of the east line of the block. The length of the said house, east and west, is one hundred and eighty-six and a half feet, including towers, and the width ninety-nine feet. On the east end there are three towers, as also on the west. Draw a line north and south one hundred and eighteen and a half feet through the center of the towers, and you have the north and south extent of ground plan, including pedestal.

We depress into the earth, at the east end, to the depth of sixteen feet, and enlarge all around beyond the lines of wall three feet for a footing.

The north and south walls are eight feet thick, clear of pedestal; they stand upon a footing of sixteen feet wall on its bearing, which slopes three feet on each side to the height of seven and a half feet. The footing of the towers rises to the same height as the side, and is one solid piece of masonry of rough ashlars, laid in good lime mortar.

The basement of the main building is divided into many rooms by walls, all having footings. The line of the basement floor is six inches above the top of the footing. From the tower on the east to the tower on the west, the face of the earth slopes six feet; four inches above the earth, on the east line, begins a promenade walk, from eleven to twenty-two feet wide, around the entire building, and approached by stone steps on all sides.

There are four towers on the four corners of the building, each starting from their footing, of twenty-six feet square; these continue sixteen and a half feet high, and come to the line of the base string course, which is eight feet above the promenade walk. At this point the towers are

reduced to twenty-five feet square; they then continue to the height of thirty-eight feet, or the height of the second string course. At this point they are reduced to twenty-three feet square; they then continue thirty-eight feet high to the third string course. The string courses continue all around the building, except when separated by buttresses. These string courses are massive mouldings from solid blocks of stone.

The two east towers then rise twenty-five feet to a string course, or cornice. The two west towers rise nineteen feet and come to their string course or cornice. The four towers then rise nine feet to the top of battlements. These towers are cylindrical, having seventeen feet diameter inside, within which stairs ascend around a solid column four [six] feet in diameter, allowing landings at the various sections of the building. These towers have each five ornamental windows on two sides, above the basement. The two center towers occupy the center of the east and west ends of the building, starting from their footings thirty-one feet square, and break off in sections in line with corner towers, to the height of the third string course. The east center tower then rises forty feet to the top of battlements; the west center tower rises thirty-four feet to the top of battlements. All the towers have spires, the details of which are not decided on.

All these towers, at their corners, have octagon turrets, terminated by octagon pinnacles five feet in diameter at base, four feet at first story, and three feet from there up. There are also on each side of these towers two buttresses, except when they come in contact with the body of the main building. The top of these buttresses show forty-eight in number, and stand upon pedestals. The space between these buttresses and turrets is two feet at first story. On the front of two center towers are two large windows, each thirty-two feet high, one above the other, neatly prepared for that place.

On the two west corner towers, and on the west end, a few feet below the top of battlements, may be seen in bold or alto relievo, the great dipper, or Ursa Major, with the pointers ranging nearly towards the North Star. (Moral, the lost may find themselves by the Priesthood.)

I will now glance at the main body of the house. I have before stated that the base was divided into many rooms. The center one is arranged for a baptismal font, and is fifty-seven feet long by thirty-five feet wide, separated from the main wall by four rooms, two on each side, nineteen feet long by twelve wide. On the east and west sides of these rooms

are four passages twelve feet wide; these lead to and from by outside doors, two on the north, and two on the south. Further east and west from these passages are four more rooms, two at each end, twenty-eight feet wide by thirty-eight and one half long. These and their walls occupy the basement. All the walls start off their footings, and rise sixteen and one half feet, and there stop with ground ceiling.

We are now up to the line of the base string course, eight feet above the promenade, or steps rising to the Temple, which terminates the cope of pedestal, and to the first floor of said house. This room is joined to the outer courts, these courts being the width between towers, sixteen feet by nine in the clear. We ascend to the floors of these courts (they being on a line with first floor of main house) by four flights of stone steps nine and one half feet wide, arranged in the basement work; the first step ranging to the outer line of towers. From these the court doors admit to any part of the building.

The size of the first large room is one hundred and twenty feet long by eighty feet wide; the height reaches nearly to the second string course. The room is arched over in the center with an elliptical arch which drops at its flank ten feet, and has thirty-eight feet span. The side ceilings have one-fourth elliptical arches, which start from the side walls of the main building, sixteen feet high, and terminate at the capitals of the columns or foot of center arch, at the height of twenty-four feet. The columns obtain their bearings direct from the footings of said house; these columns extend up to support the floor above.

The outside walls of this story are seven feet thick. The space from the termination of the foot of the center arch to the outer walls is divided into sixteen compartments, eight on each side, making rooms fourteen by fourteen, clear of partitions, and ten feet high, leaving a passage six feet wide next to each flank of center arch, which is approached from the ends. These rooms are lighted by an elliptical or oval window, whose major axis is vertical.

The second large room is one foot wider than the room below; this is in consequence of the wall being but six feet thick, falling off six inches on the inner, and six on the outer side. The second string course provides for this on the outside. The rooms of this story are similar to those below. The side walls have nine buttresses on a side, and have eight tier of windows, five on each tier.

The foot of the basement windows are eight inches above the promenade, rise three feet perpendicular, and terminate with a semi-circular head. The first story windows have twelve feet length of sash, to top of semi-circular head. The oval windows have six and one half feet length of sash. The windows of the second story are the same as those below. All these frames have four and one-half feet width of sash.

The pedestals under all the buttresses project at their base two feet; above their base, which is fifteen inches by four and a half feet wide, on each front, is a figure of a globe three feet eleven inches across, whose axis corresponds with the axis of the earth.

The base string course forms a cope for those pedestals. Above this cope the buttresses are three and a half feet, and continue to the height of one hundred feet. Above the promenade, close under the second string course, on each of the buttresses, is the moon, represented in its different phases. Close under the third string course, or cornice, is the face of the sun. Immediately above is Saturn with his rings. The buttresses terminate with a projected cope.

The only difference between the tower buttresses and the one first described is, instead of Saturn being on them, we have clouds and rays of light descending downwards.

All of these symbols are to be chiseled in bas relief on solid stone. The side walls continue above the string course, or cornice, eight and a half feet, making the walls ninety-six feet high, and are formed in battlements, interspersed with stars.

The roof is quite flat, rising only eight feet, and is to be covered with galvanized iron, or some other metal. The building is to be otherwise ornamented in many places. The whole structure is designed to symbolize some of the great architectural work above.

The basement windows recede in, from the face of outer wall to sash frame, eighteen inches, and are relieved by a large cavetto. Those windows above the base recede, from face of wall to sash frame, three feet, and are surrounded by stone jambs formed in mouldings, and surmounted by labels over each, which terminate at their horizon, excepting the oval windows, whose labels terminate on columns which extend from an enriched string course, at the foot of each window, to the center of major axis. All the windows in the towers are molded, and have stone jambs; each being crowned with label mouldings.

For further particulars, wait till the house is done, then come and see it.

The whole house covers an area of 21,850 feet.

Truman O. Angell, Architect[1]

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[1]Deseret News, August 17, 1854.

TEMPLE DESCRIPTION--1874

The block on which the Temple stands is 40 rods square. The center of the Temple is one hundred and fifty-six feet six inches due west of the center of the east line of the block. The extreme length of the Temple east and west, including towers, is one hundred and eighty-six feet and six inches. The width in the center is ninety-nine feet; the width at the ends, including towers, is one hundred and eighteen feet and six inches.

The bottom of the foundation is sixteen feet below the surface of the promenade; and spreads out at the bottom three feet beyond the vertical line of the walls for a footing.

The north and south walls are eight feet thick, clear of pedestals; the footing is eight feet deep and is one solid piece of masonry of rough ashlars, lain in lime mortar.

The basement of the main building can be divided into apartments as occasion may require, by movable partitions.

The line of the basement floor is two feet six inches above the top of the footing. In the center of the basement will be the Baptismal Font. The basement has a groin ceiling thirteen feet high from the floor.

From the east to the west end of the building the ground slopes six feet. Four inches above the ground at the east end begins a promenade, from 11 to 22 feet wide, around the entire building, and approached by stone steps as the earth slopes and requires them.

The building has six towers;--One at each end of the corners, and one in the center at each end; all starting from the footing. The corner towers are twenty-six feet square at the bottom and rise sixteen feet six inches to the line of the base string course, which is eight feet above the promenade. At the base string course the towers are all reduced to twenty-five feet square, they then continue to the height of thirty-eight feet to the second string course. At this point they are reduced to twenty-three feet square; they then continue to the third string-course thirty-eight feet. The string-courses are continued all around the building, except where they are separated by the buttresses. These string-courses are massive mouldings from solid blocks of stone. The two east corner towers rise from the third string-course 25 feet to the fourth string-course or cornice. The two west

corner towers rise 19 feet to the string-course or cornice; the four corner towers then rise 9 feet to the top of the battlements. These four towers are cylindrical and 17 feet in diameter, inside of which stone stairs ascend, around a stone newel six feet in diameter which has a well hole in it, 2 feet 6 inches in diameter, allowing landings at the various sections of the building. These corner towers have 10 windows each, 5 on each side above the basement. The two centre towers are 31 feet square at the footing, and break off in sections in line with corner towers to the height of the third string course. The east centre tower then rises 40 feet to the top of the battlements; the west centre tower rises 34 feet to the top of the battlements. Each tower has a spire and twelve pinnacles (emblematical of the First Presidency, Twelve Apostles, High Council, Bishops and their Counselors, etc.). The east centre spire rises 200 feet; the spire on the west centre rises 194 feet. All of the towers, at their corners have octagonal towers, at the top, two buttresses numbering 48 in all. The space between the buttresses and turrets is 2 feet at the first story and 2 feet 6 inches from there up. On the front of the two centre towers, there are two large windows, one above the other and each 32 feet high. On the west centre tower, a few feet below the top of the battlements, may be seen in alto relievo, Ursa Major (commonly called in this country The Dipper), with the Pointers ranging with the North Star. (Moral:--The lost may find their way by the aid of the Priesthood.)

At each end, between the towers, there are two grand entrances, each approached by sixteen steps from the promenade to the floor of the outer courts, which is about 9 feet 8 inches high. The distance between the towers is the length of the outer courts, which is 16 feet, the width 9 feet 3 inches. From the outer courts there is access to any part of the house.

The grand room on the first floor takes up the distance between the east and west towers which is 120 feet, having a width of 80 feet. This room is entered from the outer courts by four grand door-ways and is lighted by 16 windows. The height of this room in the centre is 35 feet, and is arched over in the centre with an elliptical arch which drops at its flank 11 feet and has 38 feet span.

The ceilings on each side form one-fourth of an ellipse, starting from the side walls of the main building 19 feet 6 inches from the floor and terminating at the capitals of the columns, or foot of centre arch, 24 feet above the floor. The columns obtain their bearing from

14 piers in the basement, all having a good footing. These columns help to support the inside work above the first floor. The outside walls of this story are 7 feet thick.

The space from the termination of the foot of the centre arch to the outer wall is divided into 16 compartments, 8 on each side, making rooms 14 X 14 feet in the clear and 10 feet high; leaving a passage 6 feet wide next to each flank of the centre arch, and is approached from the ends. These rooms are each lighted by an elliptical window, the major axis of which is vertical.

The second story large room is one foot wider than the first; this is because the wall is only 6 feet thick, it falling off 6 inches on the inside and 6 inches on the outside at the second string-course. The rooms of this story are similar to those of the first story. The side walls have 9 buttresses on each side; and have 8 tiers of windows, 5 in each tier.

The foot of the basement windows are 8 inches above the promenade, and each has a cavetto jamb, which has a 15 inch radius, causing the sash frame to be 18 inches back from the line of the wall. These windows have 6 feet 6 inches length of sash.

Each buttress has a pedestal which stands out from the line of wall 15 inches; is 4 feet 6 inches wide, and 5 feet 6 inches high, on which is shown the different portions of the earth; or such a portion on each one as corresponds with the axis of the earth. (Motto:--The Gospel has come for the whole earth.) The base string course forms a capital for the pedestals.

The buttresses on the side walls are 3 feet 6 inches wide and 100 feet high from the promenade. Close under the second string course, on each of the buttresses is the full face of the Sun; immediately above, on the side wall buttresses, is Saturn with her rings. The buttresses terminate with a projecting coping.

The difference between the tower buttresses and the ones just described is, instead of Saturn being on them, they have clouds and descending rays of light. All of these symbols are to be chiselled in base relief on solid stone.

The side walls continue above the third string course 8 feet 6 inches and are formed into battlements, and interspersed with stars.

The roof has 8 feet rise and is to be covered with some good metallic substance; copper is considered best.

The building is to be ornamented otherwise in many places.

The whole structure is designed to symbolize some of the great architectural works above.

All the windows above the basement recede from face of wall to sash frame 3 feet, and are surrounded by stone jambs formed in mouldings and crowned with labels. All the windows and entrances, except the basement, elliptical, and large windows in central towers, have keystones.

N.B. I omitted in the proper place, one item, which is, that each floor, as also the roof, is sustained by 7 truss, each of lattice work.

I have been very brief owing to the limited amount of time under my control.

The Temple is now up to the underside of base string course.

The Temple footing of rough ashlars measures 100,104 cubic feet or 782 1/16 cords. The cut stone now laid measures about 138,000 cubic feet.

I will now mention a few more items which perhaps will not be out of place: When the Temple footing was laid the foreman and masons contended that mortar was best when composed of 4, 5, or 6 measures of sand to one of lime. This caused a contention between them and the architect. The footing was laid in that kind of mortar. The architect then made several grades of mortar as follows:--1 to 1; 1 to 2; 1 to 3; 1 to 4; and 1 to 5 of lime and sand, and buried them for 5 years; they were then taken up, the result was that 1 of lime to 2 of sand was the best. The rest of the building so far has been laid in the best mortar.

We now have 7 courses of stone well under way.

Every stone in the Temple is numbered and is described by bills and diagrams; and when given to the cutter a ticket is given with it, describing it perfectly. The quarry men also have bills and diagrams to direct them properly.

There are now 90 stone-cutters, including boys, at work on the Temple, and about 30 quarry men, and 12 blacksmiths to make and sharpen their tools. Also 11 laborers to tend the cutters. When we are setting and everything is in good order there are about 200 hands connected with the various branches.

(Signed) T. O. Angell,
Architect[1]

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[1]Millenial Star, XXVI (May 5, 1874), 273-75.

APPENDIX III

DOCUMENTS RELATING TO THE TEMPLE

TEMPLE BLOCK EVALUATION*

Building	Value	Materials Used	Year
Salt Lake Temple	$5,000,000.00	Granite	1853-93
Temple Annex	40,000.00	Stone	1893
Boiler Room	12,000.00	Stone	1908
Stain's Conservatory	7,000.00	Glass	1870
Gate Cottage	1,500.00	Adobe	1855
Tabernacle		Stone and Lumber	1863-70
Assembly Hall	100,000.00	Stone	1910
Bureau of Information (Museum)	70,000.00	Brick	1913
Seagull Monument	15,000.00		

*Record of Church Titles, Book on Temples, Hospitals, etc. Legal Department, Church of Jesus Christ of Latter-day Saints.

DEED TO TEMPLE BLOCK[1]

January 10, 1873, Daniel H. Wells, Mayor of Salt Lake City, Utah, deeded all of Block 87, "Plat A" to Brigham Young, Sr., Deed No. 1287, as shown above. Consideration $32.50 (Act of Congress, approved March 2, 1869, Public Lands).

November 27, 1873, Brigham Young, Sr., and Mary Ann Young, his wife, transferred said Block 87, to George Albert Smith, Trustee-in-Trust, for the Church, Deed No. 18, recorded December 6, 1873, Book H, pages 828-9.

George A. Smith, as Trustee-in-Trust for the Church, transferred said Block 87 to John Taylor, as Trustee-in-Trust for the Church, Deed not in file and abstract of this property has been taken out of the file.

June 30, 1887, John Taylor, Trustee-in-Trust for the Church, transferred said property to William B. Preston, Presiding Bishop of the Church, Deed not in legal file.

December 31, 1907, William B. Preston, formerly Presiding Bishop of the Church, and Charles W. Nibley, now Presiding Bishop of the Church, transferred said Block to Joseph F. Smith, Trustee-in-Trust for the Church, Deed No. 276479, Recorded February 9, 1911, Book - 8 - E, pages 372-3.

November 27, 1923, Heber J. Grant, successor to Joseph F. Smith, Trustee-in-Trust for the Church, transferred said property to the Corporation of the President of the Church, where the Title now rests. Blanket Deed No. 502184 Recorded November 27, 1927, Book - 11 - U, pages 458-9.

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[1]Record of Church Titles, Book on Temple, Hospitals, etc. Legal Department, Church of Jesus Christ of Latter-day Saints.

TEMPLE MODEL

June 19, 1856
Great Salt Lake City

Br. William W. Ward

In reply to your communication, plans and drafts of the 18th inst. I take this early opportunity for informing you that I prefer to have the model made 12 feet 6 inches long by 7 feet 6 inches wide, 6 feet 3 inches to the top of the side walls and 12 feet 6 inches to the top of the spires, or in other words upon the scale of 3/4 of an inch to the foot.

As this model is mainly designed for the inspection and benefit of the workmen upon the Temple, and as the building containing it is designed to be removed as soon as the Temple is finished, it is not worth while to be at too much expense upon an enclosure for the model, and more especially since I do not wish the building for the model to show above the wall of the Temple Block. For these reasons I think it will be best to put up a plain room with a cheap roof, and so far sunk in the ground that the roof shall not show above the walls around the block, and large enough on the clear to admit of a walkway about 2 1/2 feet wide around the model of the size above named, and the roof just high enough to fairly clear the top of the highest spire, as the lathing can [be] nailed to the rafters. I think that we [can] afford to erect a building of the above subscription, which will answer every purpose, and know of nothing at present that will need to interfere with your labors upon the model during the coming fall and winter.

From Your Brother in the Gospel,

Brigham Young[1]

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[1]Letter to William W. Ward, Brigham Young's Letterbooks, No. 2, pp. 801-2. No evidence was found that this model was completed.

APPENDIX IV

A SHORT DESCRIPTION OF THE TEMPLE INTERIOR

There are four main entrances to the Temple, however most people arriving for the purpose of ordinance work enter through the Annex. The Annex contains the office rooms and well-equipped facilities for the extensive work of registration and record keeping. The main portion of the Annex is the Assembly Room, which occupies the central part of the building, and has seating capacity for three hundred people. The room is very spacious, has a lectern at one end and many paintings decorate the walls.

A stairway leads to the lower floor of the Annex and to the beginning of a semi-subterranean passage, which runs south ninety feet to the Temple wall. This passage terminates at the foot of a short flight of granite steps at the centre of the north wall of the main structure. The top of these steps marks the threshold of the Temple. Heavy doors divide the passage from the Temple and open directly into the lower corridor, which extends entirely across the building, from north to south. The floor is richly carpeted, the walls are embellished with large paintings, the chief of which is a canvas depicting Joseph Smith preaching to the Indian tribes of the east. The corridor as a whole presents an imposing contrast with the exceedingly plain passage without.

West from the lower corridor, and occupying the central third of the entire floor on that side is the baptismal room, in which stands the great font. This apartment is thirty two by forty five feet, and is floored with white marble. A ten inch wainscot of the same material extends along each wall, with grained wood-work above. The walls are a succession of double doors, of which the lower half is paneled wood, and the upper pebbled glass. The baptismal font is recessed three feet below the level of the floor. This circular well, tiled with marble, is twenty one feet in diameter, and is surrounded by an ornamental iron railing two feet high. In this depression stand twelve, life-sized oxen, of cast iron, with bronzed bodies and silvered horns. The oxen face outward in groups of three and support the massive font which is of cast iron enameled in white, elliptical in form, ten feet long, six feet wide, and four feet deep;

its capacity is over four hundred gallons. There are steps at either end for ascending to the balustrade and also for descending into the font.

The remainder of the west side of the basement floor is used for dressing, anointing, and lecture rooms.

On the east of the lower corridor are two assembly rooms. The first is a very plain carpeted room with folding lecture chairs for seating two hundred and fifty persons. This room is used for preliminary instruction purposes.

In striking contrast with this room is the apartment on the south entered from the lecture room by an arched doorway hung with portieres. It, also, will seat about two hundred and fifty persons but the finishings are much more elaborate. Ceiling and walls are embellished with oil paintings, the former to represent clouds and sky, with sun and moon and stars; the latter showing landscape scenes of rare beauty. There are sylvan grottoes and mossy dells, lakelets and brooks, waterfalls and rivulets, trees, vines and flowers, insects, birds and beasts, in short, the earth beautiful, as it was before the Fall. It may be called the Garden of Eden Room, for in every part and appurtenance it speaks of sweet content and blessed repose. In the center of the south wall, is a platform and an altar of prayer, reached by three steps. The altar is upholstered in velvet, and on it rests the Holy Bible. On the sides of the altar are large doorways opening directly into a conservatory of living plants.

The Grand Stairway starts near the south end of the lower corridor already described. It is provided with a stately newel post and a massive balustrade, both of solid cherry. This stairway comprises thirty-five steps with three landings, and at its top is the upper corridor, running forty feet north and south. A large canvas depicting the resurrected Christ instructing the Nephites on the western continent occupies twenty feet of wall space on the east of this corridor; and smaller paintings adorn the other walls.

The World Room: Leading off to the west from the first landing below the top of the grand stairway is a side corridor which contains an art window depicting the expulsion from Eden. It is of special significance in the journey from the Garden Room to the symbolic apartment to which this side passage leads. The room is carpeted in rich brown, and is seated in the usual way. At the west end is an upholstered prayer altar, on which are placed in readiness the Holy Scriptures. Near the altar is a stairway leading to a small waiting room adjoining the elevator landing.

The walls are entirely covered with scenic paintings and the ceiling is pictured to represent sky and cloud. The earth scenes are in strong contrast with those in the Garden Room below. Here the rocks are rent and riven; the earth-story is that of mountain uplift and seismic disruption. Beasts are contending in deadly strife, or engaged in murderous attack, or already rending their prey. The more timorous creatures are fleeing from their ravenous foes or cowering in half-concealed retreats. There are lions in combat, a tiger gloating over a fallen deer, wolves and foxes in hungry search. Birds of prey are slaying or being slain. All of the forest folk and the wild things are living under the ever-present menace of death, and it is by death they live. The trees are gnarled, mis-shapen, and blasted; shrubs maintain a precarious root-hold in rocky clefts; thorns, thistles, cacti, and noxious weeds abound; and in one quarter a destructive storm is raging. The scenes are typical of the world's condition under the curse of God.

The Terrestrial Room: From the north-west corner of the room just described is a large doorway leading into another apartment, lofty, spacious, and beautiful. Its general effect is that of combined richness and simplicity. Following the elaborate decoration of the World Room, this room is restful in its soft coloring and air of comfort. The carpet is of lavender velvet woven with simple figures. The walls are of pale blue, the ceiling and woodwork of white with trimmings of gold. At the west end is a large mirror framed in white and gold. The chairs are upholstered to harmonize with the floor-covering. A few framed canvases hang from the walls, the largest of which is the original painting by Girard--Joseph interpreting the dreams of the butler and baker. Other pictures are delineations of incidents in the life of Christ and scenes in Bible lands.

An upholstered altar stands near the east end of the room, with copies of sacred writ in place. In this room, lectures are given pertaining to the endowments and emphasizing the practical duties of a religious life. It is therefore commonly known as the upper lecture room, but in view of its relation to the room that follows, we may for convenience designate it the Terrestrial Room. At the east end is a raised floor reached by three steps, across which springs an arch of thirty feet span. The arch is supported by five columns between which hangs a silken portiere in four sections. This is the Veil of the Temple.

The Celestial Room: The entrance to this room is through the Veil. It is a large apartment occupying the northeast section on this floor. In finish and furnishings

it is the grandest of all the large rooms within the walls. The west end is occupied wholly by the Veil. The east wall is in part taken up by two triple mirrors, thirteen feet high. Along the walls are twenty two columns in pairs, with Corinthian caps; these support entablatures from which spring ten arches, four on either side and one at each end. Within the recesses formed by these arches are paints and busts of past and living Church leaders, and canvases depicting scenes in Bible lands and incidents of interest in Church history. The ceiling is a combination of vault and panel construction elaborately finished. Massive cornices and beams separating the ceiling panels are richly embellished with clusters of fruit and flowers. The color scheme of the walls is soft brown relieved by the light blue of the fluted columns and by abundant trimmings in gold. The floor is covered by a heavy carpet and the movable furniture is all of rich yet appropriate design. Palms and other living plants are held in shapely jardinieres of finest ware. Each of the four arched-window recesses in the north is framed by draped curtains of silk, which in material and design match the Veil. On the south side are four pairs of double doors in position and size symmetrically corresponding with the windows on the north. The portal at the south-west, which is fitted with swinging doors, opens directly into the upper corridor at the head of the grand stairway already described; each of the three other portals is fitted with sliding doors, and opens into a separate apartment slightly raised above the floor on the large room, and reserved for special ceremonial work.

Sealing Room for the Dead: The first of these three small rooms is raised two steps above the main floor. In the wall of semi-circular recess five feet deep on the south side is a bay art window of stained glass, representing with effective and impressing detail the resurrected prophet Moroni delivering the plates of the Book of Mormon to Joseph Smith. The west wall is occupied by a large mirror. In the center stands a richly upholstered altar finished in old-rose velvet and gold. Here kneel in humble service the living proxies representing deceased husbands and wives, parents and children.

Sealing Room for the Living: The easterly room of the three is in size and shape a counterpart of the last described. Its finishing, however, is in brighter tone; the altar and chairs are upholstered in crimson velvet, and the walls are of light tint. A mirror extends from floor to ceiling on the east wall. Here is solemnized the sacred ordinance of marriage between parties who choose to be wed in the Temple and also the sealing of children born under a civil marriage or adopted.

The Holy of Holies: The central of the three small apartments connected with the Celestial Room, situated therefore between the Sealing Room for the Living and the Sealing Room for the Dead, is of all the smaller apartments within the Temple walls by far the most beautiful. Its excellence is that of splendid simplicity rather than sumptuous splendor. It is raised above the other two rooms and is reached by an additional flight of six steps inside the sliding doors. The short staircase is bordered by hand-carved balustrades, which terminate in a pair of newel-posts bearing bronze figures symbolical of innocent childhood; these support flower clusters, each jeweled blossom enclosing an electric bulb. On the landing at the head of the steps is another archway, beneath which are sliding doors which mark the threshold of the inner room and correspond to the inner curtain or veil that shielded from public view the most sacred precincts of the Tabernacle and Temple in the earlier dispensations.

The room is circular, eighteen feet in diameter, with paneled walls separated by carved pillars supporting arches and decorated in blue and gold. The entrance doorway and the panels are framed in red velvet with an outer border finished in gold. Four wall niches, bordered in crimson and gold, have a deep blue background, and within these are tall vases holding flowers. The ceiling is a dome in which are set circular and semi-circular windows of jeweled glass, and on the outer side of these, therefore above the ceiling, are electric globes whose light penetrates into the room in countless hues of subdued intensity. On the south side of the room, opposite the entrance doorway, and corresponding in size therewith, is a window of colored glass depicting the appearance of the Eternal Father and His Son Jesus Christ to the boy Joseph Smith. This room is reserved for the higher ordinances in the Priesthood relating to the exaltation of both living and dead.

Dome Room: This room is located near the landing of the granite stairway in the southeast tower on the third floor. On the south side it has three oval windows and on the north side are semi-discs of pebbled glass looking down into the Celestial Room. In the center is a large dome, fifty one feet in circumference at its base and seven feet high. This is set with seventeen jeweled windows and is the ceiling of the Holy of Holies. The walls are hung with portraits of Church authorities. No specific ordinance work belongs to this apartment.

The Elders' Room, The Council Room of the Twelve Apostles, The Council Room of the Seventy, The Council Room of the First Presidency and the Twelve Apostles, and the

High Council Room are all located on the third floor. They are furnished to meet the needs of the number of people who will be using the rooms and reserved mostly for council and prayer meetings.

The Main Assembly Room occupies the whole fourth floor. At either end of this great auditorium is a spacious stand, a terraced platform, and a multiple series of pulpits. The two are alike as to finish and furniture. The stand at the west end is inscribed "Aaronic Priesthood," and the one at the east, "Melchisedek Priesthood." This is the higher priesthood at the east as the outside eastern towers represent the higher and the lesser at the west as the outside towers are lower and represent the lesser priesthood. The seats belonging to the body of the auditorium are of reversible construction, so that the audience may face the stand in which the Priesthood officiating on the occasion belongs.

In the interior of the Temple the appearance is strictly in keeping with the stability of the walls and in harmony with the impressive and imposing appearance presented without. However, the Temple is not beautified throughout with equal elaboration. There has been no lavish nor unnecessary expenditure in embellishment. The predominating intent has been that of appropriateness. There are many rooms of plain design, furnished in but simple style; there are others in which no effort has been spared nor cost considered to secure the essentials of grandeur and sublimity. In no part is there a hint of incompleteness, nowhere is there a suggestion of the excessively ornate. Every room has been planned and constructed for a definite purpose, and both finished and furnished in strict accordance therewith.[1]

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[1]James E. Talmage, The House of the Lord (Salt Lake City: Deseret News, 1912), pp. 181-200. The description is based on this edition.

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HISTORY OF THE CONSTRUCTION OF THE SALT LAKE TEMPLE

An Abstract of a Thesis

Presented to the

Department of History

Brigham Young University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Wallace Alan Raynor

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ABSTRACT

The Church of Jesus Christ of Latter-day Saints believes that the building of Temples is essential to fulfilling the ordinances and covenants of salvation. Prior to the arrival in Utah, July 24, 1847, the Mormon people had completed two Temples, both of which had been destroyed by external forces. Only four days after arrival land was set aside for building the Salt Lake Temple, but due to the many needs of a pioneer people in a new land to secure the permanency of their settlement, the building of the Temple was not begun until February, 1853.

The general plan for the Temple was given by President Brigham Young and the details were worked out by the Church architect, Truman O. Angell. Angell was sent to Europe, where he made an extensive study of architectural and structural details of the world's finest buildings, thus developing a Romanesque style different in design and purpose from any other building on the earth.

The realization that a plan so involved would create a great demand for a skilled work force resulted in the organization of the Public Works, which organized and assigned the necessary labor force to the Temple construction and other tasks in and around Salt Lake City, conducted an extensive

apprenticeship program, and served as a job placement station for new immigrants.

Such an elaborate and expensive project created a never ending problem of finding the financial means necessary to carry on the work. In the early years tithing labor was used extensively, but later, as the Temple rose into the square, so much skilled labor was needed that craftsmen were employed either under contract or by piece work. The responsibility for many of the large unskilled labor assignments, such as canal and road building, continued to be dependent on labor tithing and in addition, most of the wards near Salt Lake City received weekly labor assignments for quarry men and teamsters. In order to meet the cash expenses, wards at home, branches throughout the United States, and the Missions in Europe observed special Temple days, collected nickel funds, and organized various other Temple projects. Before the Temple was completed almost $3,500,000 had been expended.

The development of a transportation system to convey the huge stones to the Temple was the major factor in construction delay until the advent of the railroad in 1873. In the interim an extensive wagon road system was utilized. To facilitate transportation many experimental projects were tried, a wooden railroad was constructed and two tow-path canals, one being 12 miles in length, were excavated but

all three experiments failed. In 1873 the Wasatch and Jordan Valley narrow gauge railroad was constructed from Sandy to Wasatch with a tramway on to Alta. This 17 mile line operated until after the Temple was completed.

In 1873 the workforce on the Temple was greatly increased. The stonecutters began working year round in their small shops. The seasonal work force was doubled and between eighty and one hundred men worked ten hours a day from spring until the winter snows in December. Problems in rigging, handling and placing were ingeniously overcome. The windows were turned, the arches laid, and between four and six courses of granite were laid each year as the building gradually assumed the appearance described in the architectural plan of 1854.

Several other factors played a role in Temple history. The advent of the U.S. Army caused anxiety which resulted in the burial of the Temple foundation to avoid confiscation. Work was terminated at this time from 1857 until 1860 and upon excavation the foundation was in such poor condition that most of it had to be removed and relaid. Another delay came in 1887 when the U.S. Government seized all L.D.S. Church properties. The titles to the Temple were returned in December, 1889 and the people worked with renewed zeal as the building neared completion.

On April 6, 1893, after forty years of effort the Temple was completed and dedicated.

APPROVED:

Chairman, Advisory Committee

Member, Advisory Committee

Chairman, Major Department