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"THE FIRE FIEND DOFFS HIS HAT:" BURLINGTON'S FIRST WATER WORKS

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The rapid growth of American cities after the Civil War created numerous problems, the solution of which called for municipal efforts on an unprecedented scale. Cities had to supply municipal lighting on a wider scale than ever before. Problems of urban transportation also called for immediate action; as a city area expanded, increasing distances separated workers from places of employment, necessitating public transportation. It was imperative, too, that cities had adequate water for public health and fire protection.¹

Charles Mason was one of the first residents of Burlington, Iowa, to recognize the need of a community water system. Prior to the Civil War, Burlington citizens obtained water from cisterns or from pumps scattered throughout the town; but by the 1870's these sources were no longer adequate.² Mason, recognizing the chance for private gain in supplying a public need, tried to persuade the city to grant him a franchise to operate a municipal water system. After he founded several water companies with this end in view, he was finally

able to get a franchise for one, and as its head he led in establishing the first city water works. Mason's business history in this connection shows some of the technical and political difficulties with which one promoter in this period had to cope in creating a public service.

Mason's promotion of a city water system in Burlington was only one of the many services he rendered his adopted city and state. A native New Yorker, he had graduated from West Point in 1829, then resigned his army commis-



**Charles
Mason**

sion to practice law briefly in the East before coming to Iowa in 1837. Locating in Burlington, he entered extensively into political and business affairs. He became the first federal Chief Justice of Iowa Territory and later Commissioner of Patents in Washington while at the same time engaging in land speculation and railroad promotion on the frontier. After the Civil War he associated himself with several municipal enterprises in Burlington: establishment of the first public transportation and the first city light system as well as creation of the first water works.³

Mason and others were aware that their city needed a more adequate water supply for fire protection. A Burlington fire on October 6, 1871, burned \$80,000 in property; another followed on October 23. Two years later a series of fires re-emphasized the need for some sort of municipal water system. One of these proved to be the most destructive in the state up to that time, destroying \$250,000 in property. Another gutted the Burlington business district, including five blocks of the newest and best buildings in town, with a reported property loss of \$700,000. Mason wondered whether this would finally induce the town to take steps to put a stop to such destruction.⁴

Some Burlington citizens realized that lack of a municipal water system retarded the economic progress of the town. A newspaper correspondent to the *Burlington Hawkeye*, apparently hoping his letter would stimulate public action, pointed out that as far as water was concerned, the railroads already occupied the best business locations, those along the Mississippi River, and that the town's natural business advantages were cancelled by its lack of comparable sources of water.⁵ However, despite recognition of need for a more adequate system of water distribution in Burlington, the record of the effort to achieve one there is a history of doubt, frustration, and delay.

As early as June, 1870, Mason attempted to meet the public need by organizing a water works company which elected him a director along with sixteen others.⁶ Hoping that the extreme dryness of the season, with increased demands for water, would stimulate sales, the company put its

stock on the market.⁷ The full amount of capital stock was \$50,000; Mason first took \$5,000 of this, then increased his holdings to one third, and finally wrote in his diary that he would buy all remaining shares when he was sure the company would be a financial success. However, the stock did not sell rapidly.⁸

One obstacle to enthusiastic backing of Mason's first water company was that Burlington citizens disagreed as to the method by which water should be distributed in a city such as theirs, one built on bluffs along the Mississippi River. Mason favored a steam-operated pumping system which would distribute water under direct pressure. This system had come to his attention when a manufacturer of pumping machinery, the Holly Company of Lockport, New York, had earlier retained him as attorney to request a reissue of a patent on a water supply regulator. Mason at that time decided to attempt to introduce this method of water distribution in Burlington. Some others favored pumping water into reservoirs and delivering it to consumers by gravity. One writer to the *Burlington Hawkeye* not only favored the gravity plan but asserted that the Holly pumping machinery had been found unsatisfactory by cities which had tried it.⁹ Mason did not endorse the gravity system because, like some others, he believed that a reservoir on the highest hill in the city would not only be expensive but ineffective, because it would not supply water any higher than the first stories of many buildings. Hence it would fail to meet the requirements of reliable fire protection.¹⁰

Mason's first water company also faced opposition from those who favored having the town own and operate the water works. An editorial in the *Burlington Hawkeye* summarized some of the arguments against a privately-owned water company. It alleged, first, that private companies never voluntarily constructed water works commensurate with prospective requirements of a growing city; second, if at some future time the city purchased the system, the works would be worn out because the private company had used cheap materials; third, that a private company could charge high rates on the basis of alleged costs while it kept the only records. Various letter writers to the *Hawkeye* also expressed

the views of those opposed to a franchise for a private water company. One correspondent objected to terms which the water company proposed: that the free use of water be limited to extinguishing fires which 500 feet of hose could reach. Another writer to the newspaper charged that stockholders rather than taxpayers would benefit from the proposed contract, which called for fifty or more hydrants along two or three streets at a probable cost of \$20,000 per year to taxpayers.¹¹

Probably in response to this public opinion, a majority of the city council favored having the town build a water works. The aldermen found this impossible, however, because Burlington had already exceeded the municipal debt stipulated in the city charter. In an effort to surmount this legal barrier, one alderman proposed a petition to the legislature for an increase in the legal amount of the town's indebtedness. Perhaps the council resorted to delaying tactics in its relations with a private water company in hope that the legislature would enable the town to construct its own water system. Apparently the city council tried to obstruct creation of a private water company by refusing to come to terms on a franchise. Mason proposed an ordinance requiring the town to pay the water company for hydrants at the rate of \$100 each for five years.¹² This plan resembled one used in Dubuque, where a local water company furnished hydrants and the town paid for them as stipulated in the ordinance.¹³ Although the Burlington city council appointed a committee to confer with water company officers as to terms of an ordinance, evidently nothing came of it, since the council postponed action.¹⁴

Friends of the water company hoped an approaching city election would result in a council more favorable to a franchise, but they were disappointed.¹⁵ The new council moved no faster than the former one in water company matters. Mason submitted to them an amendment to his proposed ordinance, which they referred to a committee for study; but several months later the Holly Company wrote Mason that they had not heard anything from the council about plans for a water works.¹⁶ Mason then prepared another ordinance, and again the council referred it to a committee. When the

committee reported unanimously in favor of the proposed ordinance, Mason had high hopes the council would act on it. Once more, however, it postponed consideration of the water works question. Because Mason's efforts seemed to produce no results, at this point he was inclined to give up the whole project in disgust. Apparently his associates believed as he did; at the next called meeting of the water company directors, a quorum failed to appear.¹⁷

By the following summer, July, 1872, it appeared that the council was finally ready to reach some decision on a franchise, but the company was disappointed again. The chairman of the committee to whom the council had referred the matter, and who had promised action, left the meeting just as the bill was called up. At this point Mason was sure that the council was deliberately trifling with him, with no intention of taking action. Evidently Mason was correct in this assumption. One alderman told him that the water works project was in a confused state and that there was no immediate prospect of legislative action on it.¹⁸

Mason then attempted to revive the water works proposal by appealing to public opinion. First he wrote a letter to one of the Burlington newspapers about a city system. Then he called a public meeting to discuss the question, at which a citizens' committee with Mason as chairman was set up to meet with a similar committee from the council. They agreed to a proposal which Mason hoped would persuade the aldermen to take favorable action: that the city pay the company a maximum of \$15,000 per mile for installation of pipes and that the city collect a five-mill tax on each dollar of assessed property valuation. A new state law cleared the way for this effort. It allowed cities and incorporated towns constructing municipal systems to assess each place according to an agreed rent; thus the city would levy the tax directly on the protected property. However, Mason's optimism as to the effect of public opinion on the council was premature; at the close of 1872 he was still hoping that it would take steps in relation to water works, but for another year the aldermen took no action in that regard.¹⁹



Photo from Burlington Free Public Library

Burlington in 1800's

By 1874 the council shifted its strategy of delaying a private water company: It passed an ordinance so favorable to the water company that voters would be almost sure to defeat it. It specified that the city would pay for the first six miles of pipe at a rate of \$2,000 per mile; for the second six miles, \$1,750 per mile; for the third six miles, \$1,500 per mile; and for all above eighteen miles, \$1,000 per mile. This was 25 per cent more than the water company asked. The technical parts of the ordinance were equally generous. The grantees were bound only to furnish enough power to raise 5,000,000 gallons of water daily to a height of 200 feet above the river, with capacity to raise it 75 feet higher in emergencies. They were not obligated to use any specified plan of water distribution nor to furnish a reservoir or stand pipe to make their plan practical. As the council may have anticipated, the voters went to the polls in February, 1874, and defeated the proposed ordinance.²⁰

Mason continued to put pressure on the council for a franchise acceptable to the public. First he wrote a new ordinance,²¹ then defended it in the newspapers against its critics. To the objection that the latest proposed ordinance did not specify the size of water pipes, Mason replied that this would have entailed an expensive survey and was a matter better left to the company's discretion. He denied that private companies had failed adequately to supply other cities

with water; even if this were so, he said, Burlington had no choice because the town could not incur the expense itself. A privately-owned system would cost less to construct, Mason contended, and the company would not, as some had charged, neglect the machinery or charge exorbitant rates.²²

Mason also tried in various ways to induce the council to support the direct pressure system. He had representatives of the Holly Company explain its advantages to the aldermen and also called their attention to a trial of Holly machinery scheduled in Hyde Park, a Chicago suburb, where water would be forced through six miles of pipe. They agreed to send a delegation to witness the test, and Mason noted in his diary on September 4, "The Hyde Park pilgrims have returned."²³ Perhaps the trip bore fruit, for the council adopted the ordinance with only one dissenting vote.²⁴ However, it is evident from subsequent events that the council did not specify whether the water company should use a gravity system or a direct pressure system of distribution.

Four days after the council passed the ordinance, Mason and his associates organized a new water company, replacing the old one formed four years before. The meeting, with Mason presiding, voted to create a permanent organization as soon as the public subscribed \$50,000 in stock at \$25 per share and chose a committee to solicit subscriptions. Mason subscribed \$25,000; but since other subscriptions were only about half that amount, Mason thought that prospects for launching the new company were not very promising.²⁵

Apparently there were several reasons why the second water company failed to sell enough stock to begin operations. For one thing, a financial panic made investors reluctant to risk their money. Then, too, those favoring the gravity system undertook a publicity campaign against the pressure system which the new company wanted to use. The leader of the opposition, S. R. Bartlett, claiming to represent some of the heaviest property owners, wrote to the *Burlington Hawkeye* advocating a reservoir on North Hill which would store 1,500,000 gallons of water, all the town would need for five years. Bartlett asserted this would raise water to first floor of all the houses in town, all that one could ask, and would

do it as cheaply as direct pressure, without danger of broken machinery in emergencies. Perhaps another reason why the second water company failed to win public acceptance was the adverse report of a committee of the city council, which had been sent to Quincy, Illinois, to observe the reservoir system in operation there. The committee reported that Burlington could build on the Quincy plan with local capital and without incurring a bonded debt. The Holly system, on the other hand, would cost Burlington about \$225,000. To raise this sum, Burlington citizens would have to take \$75,000 in stock, and water bonds would have to be issued for \$150,000. As a result of these divergent views as to the type of water system the city should adopt, nothing was done between 1874 and 1877. Burlington was still without a water works when every major town between Dubuque and Burlington had built one either by municipal or private enterprise.²⁶



Photo from Burlington Free Public Library

**Fire of June 19, 1873
Burlington, Iowa**

When two more destructive fires in Burlington in June, 1877, emphasized the need of a more adequate water supply, Mason decided to make another effort to create a city water works. He and other investors organized still another company, of which Mason was president; John Patterson, vice

president; and Richard Spencer, T. W. Barhydt, and J. C. McKell, directors. They filed Articles of Incorporation in the Recorder's office on July 19, and with the Secretary of State on August 15, for an organization entitled the Burlington Water Company. They set the capital stock at \$300,000, with shares at \$100 each. Mason subscribed \$50,000 and three others took \$150,000 more. However, other subscriptions amounted to only \$22,000. Mason therefore took the remaining \$78,000 in stock, in expectation that he would eventually find people willing to take it off his hands.²⁷ He then had \$128,000 in stock and later bought ten more shares.

The next problem was to frame an ordinance that the company, the council, and the citizens would all accept. After a joint meeting of a committee of the board of trade, a committee of the city council, and others interested in a city water works, Mason drew up a proposed ordinance for the chairman of the water works committee of the city council. To gain the aldermen's approval, Mason waived some terms he had originally suggested, sacrificing high compensation for harmony between the water company and the council. Subsequently the council passed the ordinance by a vote of 13 to 1. They also adopted an additional ordinance establishing the limits of the water district, to enable them to levy a five-mill tax on assessed valuation of all taxable property in that locality. Mason then formally notified the city authorities that he was prepared to build and operate water works in Burlington under terms of the recent ordinance. Accordingly, the city and the Burlington Water Company executed a contract on October 6, 1877, granting the company the right to build and operate a water works in Burlington. Henry H. Scott, chairman of the finance committee of the council, signed the contract for the city and Mason for the water company.²⁸

Several stipulations in the ordinance probably made it acceptable to aldermen who favored a city-owned water system. It set up several guarantees which would eventually result in the city's obtaining ownership of the water works at original cost. The council provided for this by guaranteeing \$200,000 in water company bonds, which were a lien upon the

entire works. The company in turn was to limit its expenditures to no more than that amount, to be collected by means of a five-mill tax. The company agreed to omit collections of the water tax the first year, which founders estimated would mean sacrificing \$20,000. They also agreed to create a sinking fund of \$2,000 per year which would assure that all bondholders would receive payment in full within fifty years. The company would accumulate this fund by limiting stockholders to a 12 percent per annum dividend on the first \$30,000 worth of stock. All stock beyond this first \$30,000 would draw no dividend greater than 8 percent per annum. Any earnings beyond these dividends would go into a water fund to be distributed at the discretion of the council. It could be applied either to extend the mains, reduce the water tax, reduce the water rates to consumers, or increase the sinking fund. The ordinance gave the company legal existence for twenty-five years, but the city reserved the right to purchase and operate the works at any time by giving one year's notice.²⁹

The company's next problem was to sell enough bonds to finance the construction of the water works. Mason learned from A. H. Gibbs, a fire insurance executive in Connecticut to whom he had entrusted sale of the bonds, that capitalists would not buy them for cash at any price unless the water works was already completed. Gibbs attributed poor prospects on bond sales partly to the national railroad strike of 1877.³⁰ Gibbs' opinion confirmed Mason's own experience in trying to negotiate a sale of the bonds during a trip through the East. Mason's unsuccessful effort to induce Eastern capitalists to buy water bonds created the impression in Burlington that the water works project had failed again. The editor of the *Hawkeye* expressed this mood by saying that if the company managed things properly, it could sell the bonds and construct the water works.³¹

When Mason and his business associates failed to interest Eastern capitalists in water company bonds, they conceived the idea of persuading some contractor to build part of all of the water works on condition that he take his payments chiefly in company bonds. They invited bids on this basis; but

finding that none of them were such as to fall within the company's means of payment, rejected them all. Finally, the Holly Company agreed to construct the works, including thirteen miles of mains, for \$190,000, payable in 6 per cent bonds at par. Accordingly, on October 6, 1877, the Burlington Water Company and the Holly Company negotiated a contract for erection of water works. Specifications called for a water works with a pumping capacity of 4,000,000 gallons daily, with ability to throw eight streams 100 feet high on low ground and 75 feet on the hills. The water system would draw water from the river at a point where there would be a minimum depth of 18 feet. A 24-inch cast iron pipe 235 feet long would take the water into an inlet crib, then into a screen chamber and filter bed. The pumping well would receive the filtered water and the pumps would force it into the mains, distributing it through thirteen miles of pipe and 150 hydrants.³²

Despite the fact that the water works after so much delay appeared soon to be a reality, one of Mason's opponents, H. I. Chapman, caused him considerable annoyance by determined efforts to block the company's plan. Chapman bitterly opposed the water ordinance, denouncing it as a means of perpetrating a fraud upon the city. According to Chapman, the council had rushed through the proposed terms without stipulating the size of the mains or where the company was to lay them. He accused three or four councilmen of being influenced in their vote because they were stockholders and objected to the company's plan to lay two thirds of the mains on North Hill in front of homes of wealthy Burlington residents, while slighting other portions of the city.

Chapman directed part of his criticism directly at Mason. He claimed, for one thing, that Mason had a financial stake in the Holly Company, and also that there was great difference between Mason's alleged cost of construction, actual cost, and necessary cost. Mason had estimated the system would cost between \$185,000 and \$190,000 in bonds. Chapman contended the actual cost would be \$230,000, that taxpayers would pay interest on that amount of bonds, and that contractors could actually build the works for \$100,000. Chapman further expressed opposition to Mason's water company by forming a

rival one of his own, for which he claimed strong financial backing. He went so far as to file both Articles of Incorporation and written acceptance of the ordinance under which his company was organized, and promised to submit construction plans to the council for approval. As the editor of the *Hawkeye* wrote, nobody was quite sure how there happened to be two companies soliciting stock and planning water works.³³ Perhaps Chapman hoped to draw potential stockholders away from Mason's company, and thus weaken his rival, or to make his organization a rallying point for opposition to it. Whatever Chapman's purpose was, it never materialized, because the newspapers did not refer to it again.

Mason wrote several letters to the newspapers in an effort to refute Chapman's charges. He denied having any personal financial motive in urging adoption of the Holly system, and insisted it would be impossible to construct the works for \$100,000. In attempting to justify unequal distribution of mains, Mason said the company could not supply certain sections of the city with mains because of the absence of graded streets, and that in these sections there was little call for water for domestic use or fire protection.³⁴

Chapman's most serious effort to block Mason's water company was to take legal action against it. He and his supporters claimed that the ordinance was void because it did not specify the actual sum to be collected each year for water taxes. At this point Samuel Tracy, city solicitor, pointed out that the city had made no assessment on real or personal property in the water district, and gave his opinion that the mayor could not legally sign the water company bonds until the city levied the water tax in the manner required by law.³⁵

The question then was whether the mayor could or would sign the bonds so that the water company could pay the contractors and go on with construction. Mason wrote that he had tried to induce the mayor to agree that taxable property in the water district amounted to \$4,000,000 but that the mayor was "mulish."³⁶ Probably the mayor refused to sign the bonds, not only because he doubted their legality, but because

he was under political pressure from a group called the "anti-ring boys," organized to block issuing of bonds by the water company. But when Holly officials demanded part of the bonds due them so that they could carry on construction, the company applied for a writ of mandamus to show why the mayor should not sign the bonds.³⁷

The judge of the district court granted the writ of mandamus which the water company requested. He ruled that the mayor had no right to refuse to execute the ordinance when the council directed him to do so. The judge said that the mayor's refusal to certify them would destroy their intended purpose of enabling the company to raise money to build the water works. He therefore directed the mayor to sign the bonds. The defendants then gave notice of appeal to the Iowa Supreme Court.³⁸

The district court decision still did not solve the problem of getting the mayor to sign the bonds. The retiring mayor, Woodward, evaded his duty by leaving the city and hiding in the East Burlington stockyards to avoid arrest for contempt of court. The water company then awaited inauguration of the new mayor, A. G. Adams, to see what he would do about the bonds. When Adams was sworn into office, a writ of mandamus was served on him; but he filed an appeal with the district court, asking for time before signing the bonds, claiming that he was not familiar with all the facts involved. His request for delay was a device to avoid signing the bonds until a higher court ruled in the matter.³⁹

In hope that Mayor Adams would sign the bonds after the water works proved satisfactory, the contractors went ahead with construction despite the controversy. They hoped to have the pipes laid and pumping machinery installed by May, 1878. The contract for the river work, the crib, and the inlet pipe was let to Truman Cowell of Muscatine. Work commenced on the river's edge on October 17, 1877, and he

completed and covered the filter by early February. Lyman Cook and George Lauman sold the water company ground for a pump house in consideration of \$5, and workmen completed the stone foundation for a steam engine by February 4, 1878. At the same time, work of laying the mains was going forward briskly, as the Holly Company laid pipes at a rate of 1,500 feet per day. By early November, 1877, workmen had laid mains on Division Street from Main to Eighth and on Jefferson to Boundary; by December, on High Street almost to Boundary; by January 1, 1878, they had laid nine and a half miles of pipe and installed hydrants. The pumping machinery and boiler arrived in the spring and by the end of May the contractors had completed the water system on schedule.⁴⁰



Photo from Burlington Free Public Library

Burlington in 1800's

When the city tested the water system on May 31, 1878, it proved to be acceptable in every respect. The pipes proved much better than generally expected, and the pumps, too, were highly satisfactory, able to throw streams of water to an average height of 112 feet, or 40 feet more than required. The engines also fulfilled contract specifications. In a continuous twenty-four hour test, the water company pumped 5 per cent in excess of contract requirements.⁴¹

The day for demonstrating the efficiency of the new water works was one of celebration. Business houses were closed for the day. Boat excursions filled with visitors and their picnic baskets came from near-by river towns. Despite a heavy downpour, Burlington must have taken on a carnival air as the damp but enthusiastic onlookers trooped from place to place observing the phenomena of scheduled hourly water demonstrations from hydrants in various parts of the city.

Soon after the company commenced furnishing the city and citizens with water, the system proved its worth under an actual emergency. Mason, in a letter, described a fire that broke out in a barn a short distance from his home. The hose cart had to come nearly three fourths of a mile; but when firemen attached hoses to a double hydrant and turned a stream on the flames, they were soon under control. Mason wrote:

The fire fiend took off his hat and yielded the field to his acknowledged master. This is the third fire that has been squelched without making any progress. In each case the fire would have proved vitally destructive except for our works.⁴²

The demonstration of the capability and reliability of the direct pressure system silenced its critics. The editor of the *Hawkeye* observed that since the works exceeded specifications in every way, there was a general expression of satisfaction.⁴³ Mason was more graphic in his description of the public mood. He said that a few people had tried to throw every obstacle in his way; but that when the water works proved successful, the obstructionists were ashamed of themselves. He added, "There is no more talk of driving me out of the city as head of a ring to furnish water to the city."⁴⁴

The water company proved to be a financial as well as a practical success. Construction costs were less than anticipated; what the Holly Company furnished came to \$185,000 in bonds, \$5,000 less than Mason's estimate. This put the company in good condition, leaving in reserve \$15,000 in bonds. The feasibility of the city water system also promoted many more home owners to request that their property be connected with the mains, thus increasing domestic use of water and adding to the company's revenue. Mason noted that applications for water connections were coming in at a rate of fifteen

per day, with whole neighborhoods applying to have new mains laid.⁴⁵

The financial prospects of the company also improved after Mayor Adams signed the bonds. In June, 1878, after the Iowa Supreme Court affirmed the decision of the district court, compelling the mayor to sign the bonds as stipulated in the city council, he acquiesced and endorsed them. This made the bonds more valuable. The estimated amount of dividends due stockholders to June, 1879, was \$2,999.80. The company paid its first dividend in August, and Mason's share was \$1,689.97. This was fortunate because his salary that year as president of the water company was only \$500.⁴⁶

Mason's returns from the water company were scarcely commensurate with the financial contributions he made to it. His stock in the water company, when fully paid for, would have cost \$129,000. In a letter to a Burlington newspaper, he had defended the water company by saying that he was risking his entire fortune in it. Perhaps his greatest satisfaction before he died in 1882 was his knowledge of how much he had contributed to the physical welfare and safety of his community.

FOOTNOTES

¹ Arthur Scheslinger, *The Rise of the City* (New York, 1933), pp. 98, 104-105.

² *History of Des Moines County, Iowa* (Chicago, 1879), p. 509.

³ Emlin M'Clain, "Charles Mason—Iowa's First Jurist," *Annals of Iowa*, Third Series, IV (Jan. 1901), p. 607.

⁴ Charles Mason Diary, Oct. 23, 1871; Oct. 10, 1873, in *Mason Collected Papers and Diaries*, Vol. 49, MSS in Iowa State Dep't. of History and Archives, Des Moines, Iowa.

⁵ *Burlington Hawkeye*, Jan. 21, 1872.

⁶ Mason Diary, June 22, 1870, Vol. 49.

⁷ *Burlington Hawkeye*, June 22, 1870, Vol. 49.

⁸ Mason Diary, July 2, 1870, Vol. 49.

⁹ *Burlington Hawkeye*, Jan. 23, 1872.

¹⁰ Mason Diary, May 25, 1870, Vol. 49.

¹¹ *Burlington Hawkeye*, Jan. 23, 25, 1872; Aug. 1, 1874.

¹² Mason Diary, July 30, 1870, Vol. 49.

¹³ T. L. Bowman to Mason, Aug. 21, 1870, Vol. 22.

¹⁴ Mason Diary, Nov. 7, 16, 1870, Vol. 49.

¹⁵ John Gear to Mason, Dec. 7, 1870, Vol. 22.

¹⁶ Charles Keep to Mason, Aug. 14, 1871, Vol. 23.

¹⁷ Mason Diary, Sept. 21, 22; Oct. 12, 16, 25; Dec. 9, 1871, Vol. 49.

¹⁸ C. B. Harrington to Mason, Nov. 24, 1872, Vol. 24.

- ¹⁹ Mason Diary, Aug. 16, Nov. 28, Dec. 3, 1872, Vol. 49.
²⁰ *Burlington Hawkeye*, Jan. 11, 1874.
²¹ Mason Diary, July 10, 1874, Vol. 49.
²² *Burlington Hawkeye*, Aug. 2, 1874.
²³ Mason Diary, Aug. 31, Sept. 4, 1874, Vol. 49.
²⁴ *Burlington Hawkeye*, Sept. 21, 1874.
²⁵ Mason Diary, Sept. 26, 1874, Vol. 49.
²⁶ *Burlington Hawkeye*, Oct. 4, 11; Nov. 11, 1874; May 14, 1876.
²⁷ Mason Diary, May 7, 1877, Vol. 49.
²⁸ *Burlington Hawkeye*, July 20, 1877.
²⁹ Mason Diary, April 6, 19, 20, 21, 23, 1877, Vol. 49.
³⁰ A. H. Gibbs to Mason, July 20, 1877, Vol. 28.
³¹ *Burlington Hawkeye*, June 19, 1877.
³² Mason Diary, Sept. 29, 1877, Vol. 49.
³³ *Burlington Hawkeye*, May 22, 23; June 6; Oct. 19, 24, 1877.
³⁴ Mason Diary, June 23, Oct. 25, 1877.
³⁵ *Burlington Hawkeye*, Nov. 28, 1877.
³⁶ Mason Diary, Jan. 10, 1878, Vol. 49.
³⁷ Mark Foote to Mason, Jan. 30, 1878, Vol. 28.
³⁸ *Burlington Hawkeye*, Mar. 14, 1878.
³⁹ *Ibid.*, Mar. 17, 21, 1878.
⁴⁰ Mason Diary, Oct. 9, 23; Nov. 3, 28; Dec. 6, 1877; Jan. 2, Apr. 12, 19, 29, 1878.
⁴¹ *Burlington Hawkeye*, June 1, 1878.
⁴² Charles Mason to D. C. Lawrence (no place or date given), Vol. 45.
⁴³ *Burlington Hawkeye*, June 1, 1878.
⁴⁴ Mason to D. C. Lawrence, Vol. 45.
⁴⁵ Mason Diary, Nov. 1, 1878, Vol. 49.
⁴⁶ William Torrey to Mason, Dec. 30, 1879, Vol. 29.

MUSEUM NOTES

By John Phipps

Iowa's fame as an agricultural state is worldwide and uncontested. However, an obscure facet of technological research in our state is emphasized in a new display on electronic computers. This material was presented to the Museum by the Engineering Department at Iowa State University, Ames, and is now on permanent display in the second floor Civil History section. The exhibit portrays the evolution of man-made counting devices from the very primitive to the exotic modern day digital computer. Of particular interest to Iowans is the fact that the ancestor of all modern "electronic brains" was conceived, constructed and used in Iowa during the early 1940's.