THE PALIMPSEST

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The Dubuque Shot Tower

If the end of an ordinary shotgun shell be uncrimped, out will roll scores of shining shot, beautifully burnished, perfectly graded as to size, and absolutely round. If the shot were not uniform both as to form and substance they would go wide of the mark. Some of them would fall short of the target because their imperfections would result in a lower velocity through the air than the average of the charge. Others would be diverted from the theoretical course because they were not round. Uniformity and perfection in shot are essential.

The evolution of shot has been a long process, but the basic principle upon which they are manufactured has remained the same since pre-Revolutionary days. Shotgun pellets begin their career at the top of a shot tower where molten lead is poured into a dropping pan with a finely-perforated bottom. In Washington's time the Natural Bridge of Virginia was used as the vantage point from which molten lead was poured and the re-

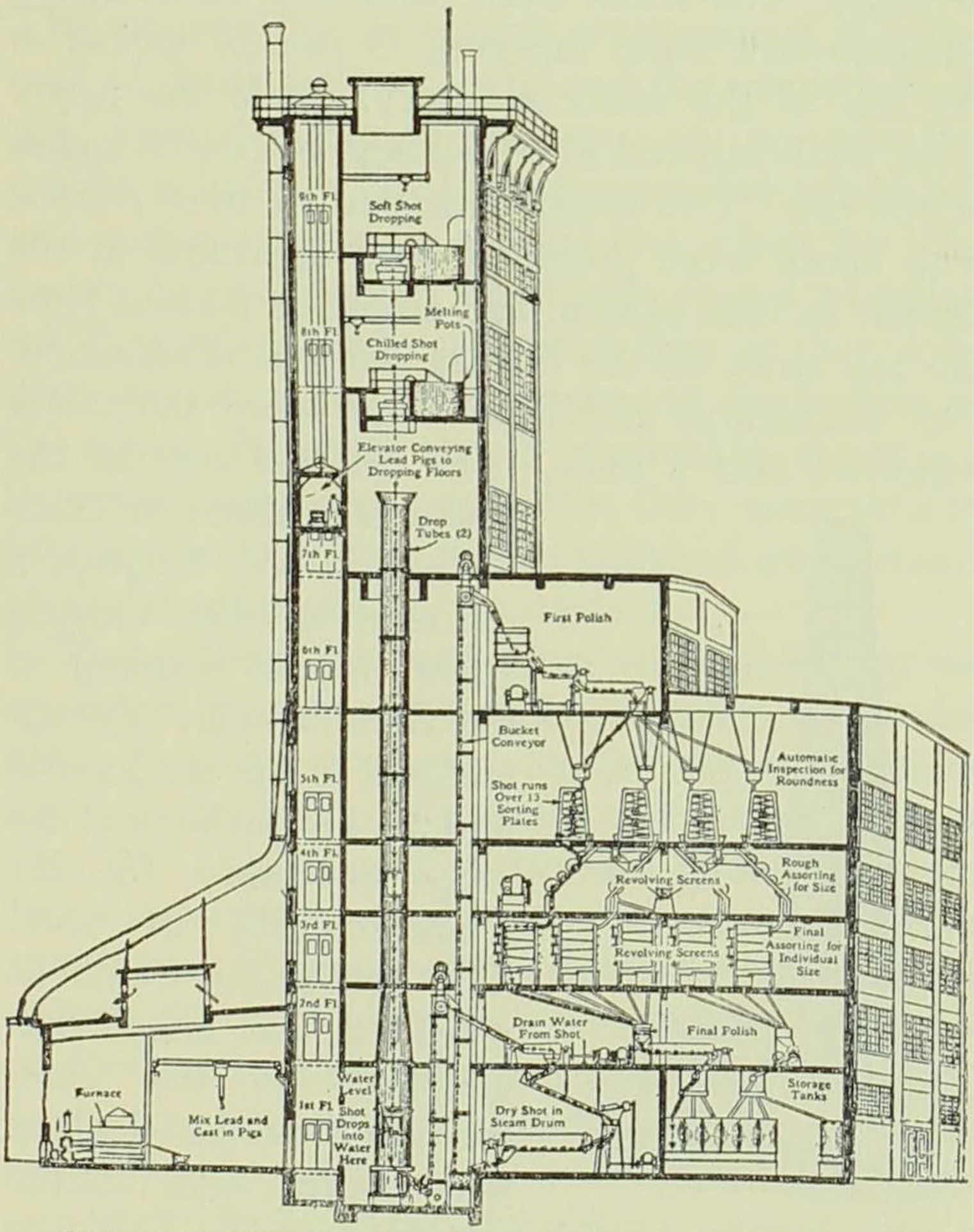
sulting pellets were picked up by hand from the stream below. Today the Winchester plant in New Haven, Connecticut, a nine-story shot tower, 154 feet in height, especially built and equipped, substitutes for the Natural Bridge. But Iowa, too, has an historic shot tower. The story of how shot was manufactured in the Hawkeye State is replete with interest.

Prior to the Civil War, Dubuque was an important lead mining center, but lead manufacturing was not well-developed. The lead ore that was mined at Dubuque would be shipped to St. Louis in pigs weighing seventy pounds each. At Herculaneum, just below St. Louis, a portion of it was made into shot.

From St. Louis the lead shot might be shipped to New York or other eastern cities, from whence residents of Dubuque could buy it only at a price much higher than that for which the finished product could have been manufactured and sold in Dubuque. To alleviate this situation and to stimulate local manufacturing, George W. Rogers and Company, in 1856, erected the now venerable old Shot Tower at Dubuque — a structure that has served well to connect the present with the past, and is worthy of a place in the annals of Iowa history.

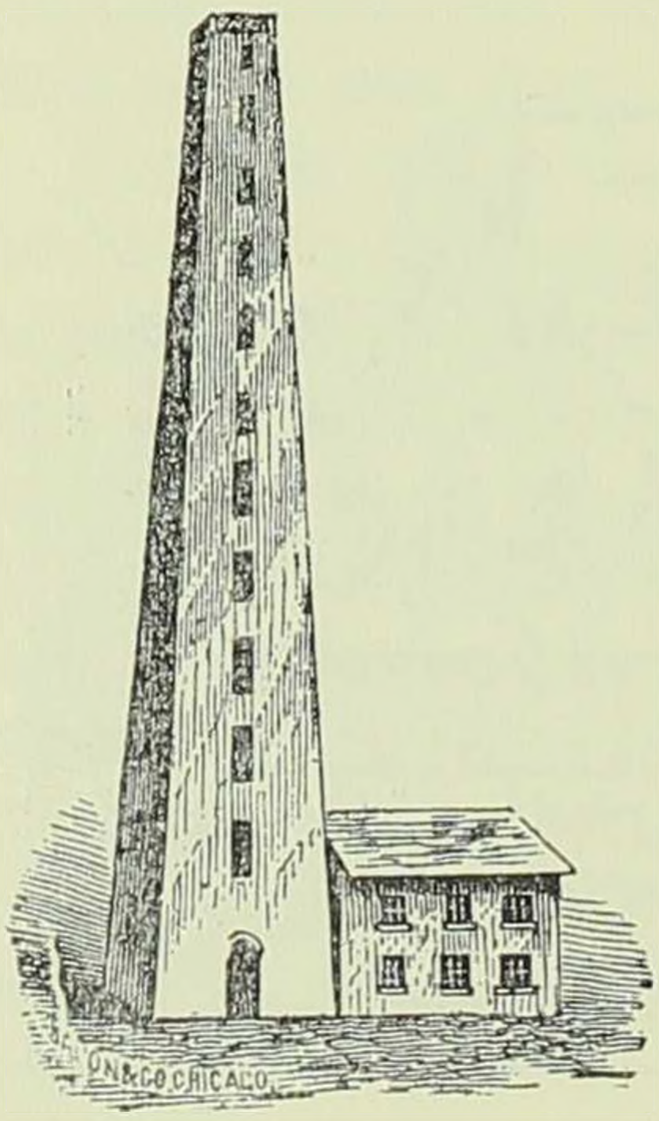
The Shot Tower was erected on what was then designated as "Tower Street," near the bank of

the Mississippi. It is now commonly referred to as being located at the corner of Fourth Street and



SCHEMATIC PLAN OF THE WINCHESTER SHOT TOWER

Commercial Avenue. Originally the structure was 150 feet in height. The first 110 feet of the obelisk were built of stone quarried from the limestone hills of Dubuque, and the remaining 40 feet were of brick. The walls were three feet thick at the nineteen-foot base, tapering to twenty inches at the top of the stone masonry, while the upper brick walls tapered to a thickness of twelve inches at the top. The tower consisted of nine stories. The floors were provided with apertures in the center, so that molten lead might be poured from the top story to the bottom without obstruction. For ventilation and light there were thirty-five windows and a door. The original cost of the tower was about $10,000.



George W. Rogers, a gunsmith and the "moving spirit" in the building of the Shot Tower, was interested in the mechanism and in the mechanical devices necessary for the manufacturing of shot. The equipment which he provided was simple but effective. In the lower room of the tower the lead was melted and diluted with a one-hundredth part of arsenic. This was

done to make the solution solidify more readily and more perfectly when cooling.

Drawn to the top of the tower by means of a windlass and lift, the molten metal was poured into a perforated vat or colander-like receptacle. The holes in this receptacle were spaced at intervals of about half an inch, and the magnitude of the holes determined the size of the escaping molten solution. The lead thus treated would fall in a steady stream for several feet. Then the glistening cascade would break into round globules, which hardened into pellets of shot as they were plunged into a vat of cold water at the bottom of the tower. After the shot were dried by steam in a large flat-bottomed iron kettle, they were poured into a revolving cask which polished away many of the rough spots on the surfaces.

The perfect shot were then separated from the imperfect by means of an ingeniously simple device. For this operation the pellets were raised again to the top of the tower and dropped into a "tester." This was a succession of inclined surfaces constructed in the form of steps. Between the several steps were little troughs into which the oblong and imperfect shot would fall, while the perfectly round shot, because of their greater velocity as they rushed down the incline, would jump over the troughs and be caught in a separate receiver. From there they were passed into a

"sizer" — a device similar to a chest of drawers, with apertures varying in diameter to select shot of various sizes. When the shot were assorted they were placed in twenty-five pound bags ready for shipment, or, for the "convenience of sportsmen," they were sometimes placed in sacks of twelve and a quarter pounds each.

In a modern shot tower essentially the same methods are employed as were used in the Dubuque Shot Tower more than three-quarters of a century ago. If a drop of lead is given a free fall it is formed into a perfect sphere by a combination of surface tension and air resistance. As the metal passes through the small holes of the dropping pan, it adheres to the bottom, as water does, until a drop of a certain size has formed, then it breaks loose. Therefore the holes in the suspended vat are smaller than the resulting shot. Thus a modern dropping pan is perforated with thousands of tiny holes and the downpour of molten lead forms a veritable spray.

In modern plants, too, as in the Dubuque Tower, gravity does the work of culling and sorting sizes. As the shot roll along inclined planes, the perfectly round ones gain momentum and jump the carefully adjusted gaps in the runway, while the less perfect shot are impeded and fall by the wayside. The perfect shot are then passed over revolving screens which are perforated to

sort the sizes. From beginning to end of the process of making shot there is no need for human hands to touch the shot. Just as in the old shot tower at Dubuque, gravity carries the shot from stage to stage.

Perhaps because of a lack of funds with which to operate, or it may have been for other reasons, the Dubuque Shot Tower passed into the possession of various individuals at an early date. In 1858 it was listed under the ownership of Cook and Langworthy and in 1859 it was leased to Peleg Tallman and Company. Tallman was essentially a real estate broker and not a manufacturer. Accordingly, the Tower soon "fell into the hands of J. K. Graves," a native of New Hampshire who had come to Dubuque in 1855, and entered the banking business. Later he became a successful banker, mayor of the city of Dubuque, a member of the Iowa General Assembly, and a railroad builder. But in 1859 his interests were divided between banking and the manufacturing of shot. Under the ownership of Graves the Shot Tower came into wide recognition, not only for its manufacturing interests, but for the legal controversies in which it became involved.

At the outset Graves manufactured shot in sufficient quantities to become a formidable competitor of a St. Louis shot manufacturing company. In 1862 Chadbourne and Forster of St. Louis

sought to eliminate this competition by purchasing the Dubuque Shot Tower. The purchase was made with the stipulation that Graves would not "erect another tower" for the manufacturing of shot in the Dubuque area. At the time of the purchase there was a rumor that the purchasers contemplated the investment of additional funds to develop the shot manufacturing industry in Dubuque. But despite the rumors there was no such promise, and obviously no such intent on the part of the purchasers. Indeed, quite the opposite view was expressed very vividly in *The Dubuque Daily Times* of July 27, 1862.

"The day before yesterday," said the *Times*, "Messrs. Chadbourne & Forster of St. Louis, paid $3,000 for the Dubuque Shot Tower, for the purpose of having a troublesome rival out of the way. Although they promised to expend $5,000 on it and set it at work, in order to pacify many dissatisfied business men in the city, they of course do not intend to do any such thing. No, they privately informed their agents that they intend to board up the windows, take out the machinery, lock the door and throw the key into the river. Rather than have another sack of shot made in Dubuque, said they, we will put a keg of powder under the tower and blow it higher than Gilderoy's kite."

It is further reported that the day after the pur-

chase was completed and the property transferred, the wholesale price of shot, throughout the entire northwest, advanced twenty-five cents per sack. Chadbourne and Forster, it was said, manufactured 1,000 sacks of shot per day, thus bringing into their treasury an additional profit of $250 per day — a sum sufficient to pay the purchase price of the Dubuque Tower in twelve days.

The attitude of Dubuque businessmen toward the new purchasers was not a kindly one. Yet it was frankly admitted that purchasers have "a perfect right to buy up their rivals in business, and make as much money as they can." But the incident was not to be passed over lightly. No sooner was the Shot Tower sold than a party of Dubuque residents, with Graves as one of the sponsors, took a wagonload of all the necessary implements and started out to experiment with an idea that had been current in Dubuque for some time.

Graves and his party had melting pots, lead, ladles, ropes, tubs, and firewood. Going out to the western edge of Dubuque they soon came to an open shaft of an abandoned lead mine about 140 feet in depth. A short distance from the shaft they built a fire and proceeded to melt a quantity of tempered lead. Attaching ropes to a washtub partly filled with water, they let it down to the bottom of the pit. This was for the purpose of catching the pellets of lead they were about to

pour forth. A sieve was adjusted at the ground level above the tub and molten lead was poured through in the same manner as had been pursued at the Shot Tower.

When the tub was slowly and laboriously drawn to the surface, and the contents examined, there were exclamations of joy. "Hurrah! It's a success!" one of the party declared. Soon other abandoned mines were sought, and for a time it appeared that this improvised method of manufacturing shot in abandoned mine shafts might furnish real competition in the shot-producing industry. The purchasers of the Shot Tower sought to restrain the manufacture of shot by this method, but they were unsuccessful. It was not expedient for them to buy all of the abandoned mine shafts in the Dubuque area, and so for several years shot manufacturing by this method flourished in Dubuque.

Meanwhile the old Shot Tower on the bank of the Mississippi River witnessed many changes. In 1874 John Deery obtained permission from the owners to place on top of the tower "an equestrian statue of Andrew Jackson." The statue, made of wood, it is said, was the work of Thomas Kavanaugh, and was set in place by John Dreyhouse. Towering above the city and overlooking the Father of Waters, the statue remained until, badly weathered and worn, it was removed in 1881.

In later years the old Shot Tower was used by the Standard Lumber Company as a watchtower. In the river front fire of 1911 much of the inside framework of the historic structure was destroyed. Since then the tower has served only as "a habitation for sparrows and pigeons." But it is worthy to be dedicated to a more noble purpose.

Subsequent to the fire, the site of the Tower was known as "block 7 of Dubuque Harbor Improvement Company's Addition to Dubuque," and it was planned that it should become a part of the Allison-Henderson Memorial Park. But, alas, well-laid plans sometimes go awry. And so the old Tower has stood through the years, awaiting the time when interested citizens should rescue it from oblivion.

When a good man serves his fellows, we honor him; when he retires, we give him praise. So may it be with our historic landmarks. In the printed page, in pictures, in story, and in memory, the Old Shot Tower still lives and holds a place unique in the annals of Iowa history. Serving as a connecting link between the pioneer past and the present, representing an industry that once prospered in Dubuque, the Shot Tower has witnessed the influx of immigrant hordes, the growth of the grain trade, the development of the rafting and lumbering industry, the coming of the railroad, the bridging of the Mississippi, the fearful ravages of fire

and flood, and scores of other dramatic events.

The Shot Tower saw the arrival of Abraham Lincoln at Dubuque in 1859. It was there to greet Amos Bronson Alcott, Ralph Waldo Emerson, Wendell Phillips, Mark Twain, and a host of other eminent visitors. The Shot Tower was a familiar sight to the Langworthy brothers, to Austin Adams, David B. Henderson, William Boyd Allison, and many other distinguished citizens of Dubuque. It has stood sentinel-like to welcome the return of soldiers and sailors of four wars — the Civil War, the Spanish-American War, World War I, and World War II. It is, indeed, an historic Iowa landmark that should be preserved for the edification of future generations.

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