



ASC HISTORY NEWSLETTER

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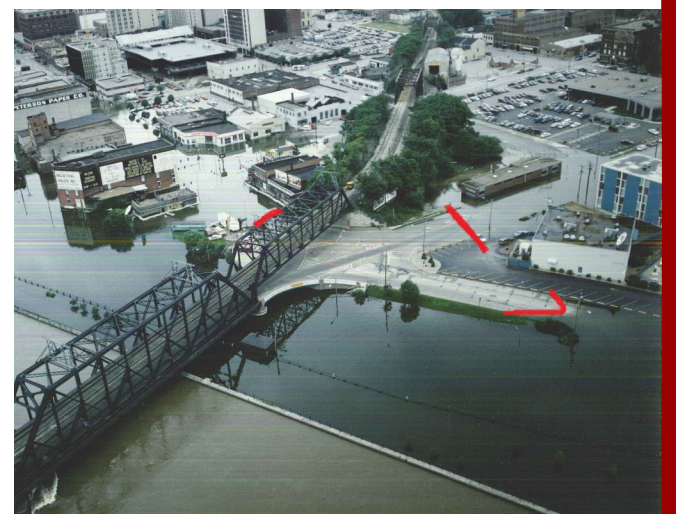
The Great Flood of 1993 at RIA

At the time of this writing the barriers have already gone up twice this year in Davenport, but river levels this year are nothing compared to 22.63 foot crest level of the waters in the 1993 Great Flood. During the summer of 1993, Iowa received 26.79 inches of rain, which allowed for flood waters to threaten Arsenal Island for almost five weeks. (The previous record for rain fall was only 21.18 inches set in 1892) In order to prepare for the predicted flood cresting on July 4, around the clock levee watchers were provided from the Directorate of Engineering and Housing, layers of sandbags and plastic were placed up to six feet high in building openings, and plywood was used to secure windows. After protecting the island from the first crest of 22.0 feet the Arsenal relaxed a little, but the river again crested at the record breaking 22.63 feet on July 8 and 9. For the total flood relief effort, 17,000 manhours, including military, DAC, and volunteer time, 6,844 tons of sand, and 13 tons of crushed rock were used. In the aftermath of the flood, 1.5 miles of roads and levees were damaged, 25 of the island's 946 acres were inundated with flood water, and Quarters 31 was evacuated as a precaution.

Such "positive" outcomes from the 1993 flood were possible due to the remedial

actions after the record flood of 1965. Although in 1965 the river crested at 22.48 feet, Arsenal Island was far less prepared, and as a result took on much more water and damage. Produced by ice gorges in the Minnesota River and rapidly melting snow which fed into the upper tributaries of the Mississippi river, a 19.5 foot flood crest was expected in Davenport of April 26, 1965. Then, as now, flood stage was 15 feet. Based on the forecast, workers prepared protection for flood waters up to 20 feet. However, mother nature has a way of not behaving as we predict. Two days before the estimated crest, predictions jumped up to a 21.5 foot crest, throwing workers into overdrive to raise the flood protection two more feet. The river continued to rise and overwhelmed those efforts when it peaked on April 28. Over 300 of the island's 900 acres were submerged. Over 375,000 sandbags were filled with approximately 8,000 tons of sand. Equipment used in filling and delivering bags to levees or dikes consisted of six semi's, four flat-bed trucks, two dumpers, two end loaders, two bulldozers, 14 forklifts, three Otters (WWII era amphibious personnel or cargo carriers that were mothballed on the Arsenal), and 150 short D-handle shovels.

The most recent example of high water was in 2011, when the waters crested at 20.7 feet. Although this is not a record breaker, it still falls into the category of a 100 year flood, or a flood that has only a 1% chance of it reoccurring in a given year. In 2011 very little of the island saw water encroachment, a sure sign that as severe floods happen more frequently, Arsenal Island gets ever better in preventing flood damage and keeping the Island dry.



In the 1993 Flood all Davenport approaches to the Government Bridge were underwater. The red markings show the water line.

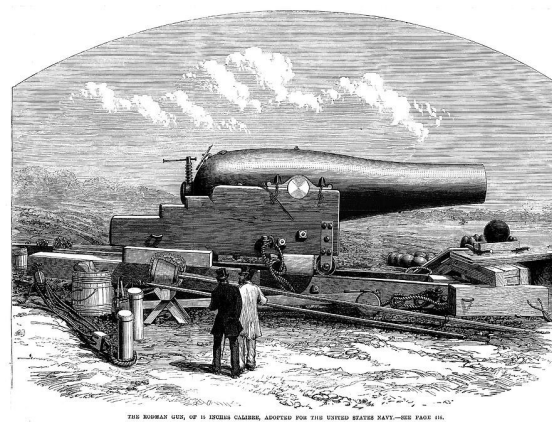
Rodman the Engineer

Thomas J. Rodman, a brilliant graduate of the U.S. Military Academy Class of 1841, had an impressive record of service prior to his assignment at Rock Island. He had investigated and developed new ordnance concepts in the field of metallurgy and propellants, and his rank of Brevet Brigadier General was bestowed on him for meritorious and distinguished service in the Ordnance Department during the Civil War. Rodman maintained this honorary commission until his death in 1871.

One of Rodman's greatest achievements was the development of the "Rodman Casting Process" which revolutionized the art of casting cannons. His casting method cooled an iron gun from the interior while keeping the exterior in a fluid state. The inner walls of the gun solidified first causing successive layers of metal to shrink one upon another. The result was a stronger, safer cannon that was more reliable and longer lasting than other guns of the era. The life of a gun was increased 11 to 20 times when cast by the Rodman process. The army adopted the water-cooled, hollow casting of cannons in the year 1859, 14 years after Rodman had conceived the

process.

With the development of the steam engine, methods of calculating pressure were avail-



able to Rodman. Through his scientific research of internal ballistics, Rodman was able to determine the pressure curve for specific guns. Based on this information, he designed the Rodman Gun so that the gun tube was cast thickest at the point of greatest pressure and then narrowed as the pressure decreased. The new "coke bottle" shaped gun and the new casting process made the Rodman gun a major technological improvement over the most significant

weapons advancements of the Civil War.

Rodman's later work on gunpowder also proved significant. He developed a new gunpowder formula which laid the groundwork for the modern pellet powder. By 1860, he had begun to develop powder to fit the caliber of the gun by devising a formula whereby gunpowder could be compressed into disks. These disks, referred to as perforated cake powder burned slower than ordinary cannon powder. Rodman's perforated cake powder also provided more thrust and more uniform pressure along the gun's bore, thereby reducing the strain on the gun and increasing its firing distance. Earlier experiments with different types of powder led Rodman to the development of "prismatic" powder. This prism-shaped powder maintained chamber pressure at a greater level than other gunpowder without increasing the pressure or strain on the gun tube. The muzzle velocity of the projectile was also increased without an additional strain on the tube.

A few years later, Rodman would expand his engineering genius to the architecture and building of the Rock Island Arsenal.

This MONTH in military history...

1676: King Philip's War ends

1812: Detroit surrenders without a fight

1945: Japan agrees to Potsdam terms

1776: London learns of American Independence

1898: Armistice ends the Spanish-American War

1972: Last US ground combat unit departs Vietnam

