mune was second. One certainly heard more of Masamune than of any other of the old swordsmiths of Japan. He died at the age of eighty years at Kamakura, to which place he had come from Kyoto when seventy-one years of age.

My interest in the sword brought me into contact with a class of Japanese little seen by foreigners. I mean the genuine old-fashioned type; and from contact with these men, and knowledge acquired thereby, I think that one of the finest types of humanity was the medieval Japanese. They were possessed with a sense of honor, a devotion to duty regardless of consequences, unsurpassed elsewhere. Their point of view, of course, was different from ours, and may seem grotesque to us in many ways, but their sincerity and fidelity are not to be questioned.

THE CAHOKIA AND SURROUNDING MOUND GROUPS.*

BY D. I. BUSHNELL, JR.

THE LARGEST MOUND IN UNITED STATES, WHICH COVERS MORE SPACE THAN ANY EGYPTIAN PYRAMID.

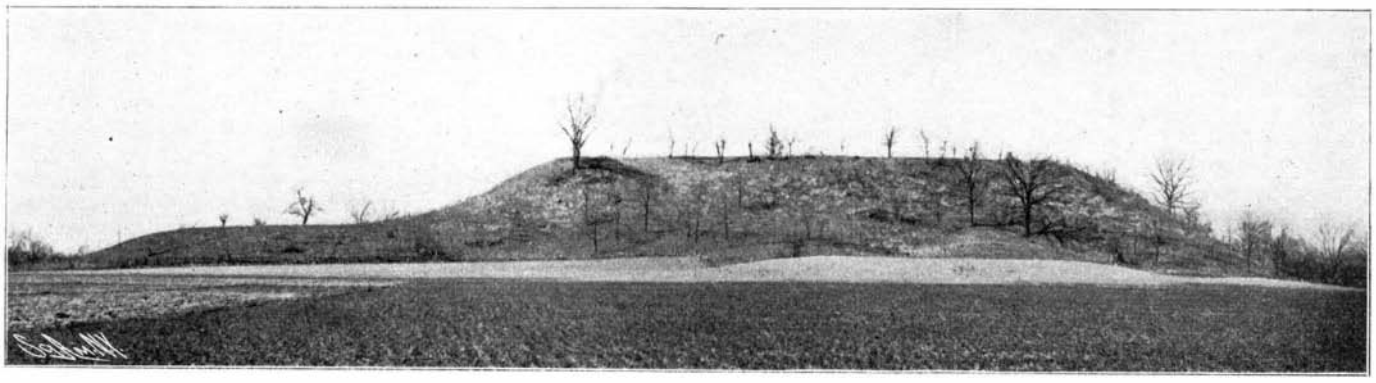
Below the mouth of the Missouri, for a distance of some 60 or 70 miles, the Mississippi is bordered on the east by the rich alluvial plain to which the name American Bottom is generally applied.

The plain rises gradually as it leaves the river, until it reaches the line of bluffs which forms its eastern boundary. In width it varies from 2 to 10 miles. At 38 deg. 40 min. N. L.—the location of the Cahokia group—the bluff line is 8 miles from the river. The country west of the Mississippi, unlike the lowland opposite, is high and rolling, and formerly, before the city of St. Louis occupied the site, a limestone cliff rose abruptly from the river.

Near the center of the American Bottom is the largest artificial earth work in the United States, the great Cahokia Mound, which rises in four terraces to a height of 100 feet above the original surface. Its greatest dimension is from north to south, 1,080 feet; its width from east to west is 710 feet; while the area of the base is 14 acres.

One of the Lesser Mounds of the Cahokia Group.

Another Lesser Mound.



CAHOKIA MOUND: A TRUNCATED PYRAMID COVERING 14 ACRES, OR MORE THAN IS COVERED BY THE LARGEST EGYPTIAN PYRAMID.

Cahokia is surrounded by a group of more than seventy lesser mounds, any one of which, if not overshadowed by that great truncated pyramid, would itself be considered great.

The mounds of this group are of two classes—conical and truncated, and rectangular pyramidal. The larger mounds belong to the latter class, and were erected with their sides toward the cardinal points.

One and six-tenths miles west of Cahokia is a group of five mounds, the largest of which is one of the most perfect in the American Bottom. Extending in a southwesterly direction from this group is a chain of mounds which terminated at a group of fifteen smaller mounds, near the Mississippi, all of which have been destroyed. Across the river from this point a group of twenty-six mounds formerly existed on the summit of the bluff. These were destroyed many years ago, when the area was cleared and buildings erected, forming a part of St. Louis. A large isolated mound was located about 600 yards north of the main group. It was removed during the winter of 1869, and was found to contain a cavity or chamber in which were discovered many human remains and quantities of shell beads.

About 7½ miles northwest of Cahokia, and some 3 miles east of the Mississippi, is a group of eleven large mounds on the north side of Long Lake. These mounds, with the exception of one, have never been explored. Some years ago the largest was destroyed by the construction of railroad grades. At that time many interesting objects of bone, stone, and copper were discovered. The slope of the bluff eastward from the Cahokia group appears to have been one extensive burial ground. The great quantities of human bones which have been exposed by the plow and by the washing and wearing away of the surface prove that a great population, all traces of which are rapidly vanishing, once occupied that fertile region. Northeast of Cahokia, on the bluff, are two large conical mounds, perfect examples of that type. From the summit of these mounds a magnificent panoramic view of the American Bottom is obtainable. The great Cahokia group is clearly defined, surrounded by the homes and fields of the present owners of the land, while to the westward may be seen the waters of the Mississippi.

The name Cahokia applied to the mound group perpetuates the name of an Illinois tribe, which, together with the Tamoons, formerly lived in that part of the valley.

Few of the many mounds which formerly existed on either side of the river now remain in their original condition. Two entire groups have been destroyed to make room for buildings, while others, especially the Cahokia group, are being slowly but surely destroyed by the plow. Either the National government or the State of Illinois should act at once, and make the area occupied by the Great Cahokia and surrounding mounds a park, that these monuments of an unknown race may be preserved for future generations. The questions when, by whom, and for what purpose these mounds were erected cannot be answered.

THE FOREST PARK GROUPS.

There were formerly two groups of small mounds located near the center of the western half of Forest Park, in St. Louis, which area is now known as the World's Fair site.

When, during the autumn of 1901, it became necessary to grade that part of the park preparatory to the erection of certain buildings of the exposition, I was enabled to explore the mounds.

The two groups were distinctly separate, the smaller group of seven being located on the summit of the ridge or elevated ground to the south of the River des Peres, while the second group was in the lowland on the immediate bank of the stream. The average dimensions of the mounds of the smaller group were: diameter, 48 feet; elevation, 3 feet. In all were discovered pieces of chert, potsherds, and charcoal scattered over the original surface. The mounds of the lower group were somewhat higher and several feet less in diameter. They were likewise explored, but nothing indicating the handiwork of man was discovered.

The question has often been asked, For what purpose were these mounds, so numerous throughout the Mississippi Valley, erected? In the case of the seven mounds on the elevated ground, the finding of potsherds, pieces of chipped chert, and the indication of fire, all on what appeared to have been the original surface, would point strongly to their having been the remains or ruins of earth-covered lodges. The early explorers mention such lodges in different parts of the valley, and, until the last quarter century, large villages of such habitations were to be found in the upper Missouri Valley. But in the other mounds these indications did not occur. Clearly they were erected as they existed at the time of their destruction.

* Abstract of Paper being published by the Peabody Museum, Harvard University.

The Death of John S. King.

Mr. John S. King, for many years business manager of the Iron Age, the Metal Worker, and Carpentry and Building, died at his home on March 4, at the age of sixty-three. After having served with distinction during the entire civil war, Mr. King came to New York city, in 1868, and almost from the very beginning, identified himself with the business management of the various publications of the David Williams Company.

Brief Notes Concerning Patents.

A railroad tie of concrete and metal has been invented by G. M. Burbank, general manager of the Hecla Belt Line, Bay City, Mich. The tie consists of a cement form molded around a stiffening framework of twisted tiebar and an upwardly-bowed stiffening plate supported at either end by wooden blocks. The blocks extend above the surface of the tie, and form a resilient support for the rails. The wooden blocks are covered by broad plates with holes provided so that the tracks may be spiked to them; and as the plates comprise part of the tiebar referred to above, the whole forms a very solid construction. The under surface of the cement body is arched upward to decrease the size and weight. These ties have been in experimental service for some time under the tracks of the Hecla Belt Line, and have proven very serviceable.

On September 1 there died at Watertown, N. Y., Daniel Minthorn, who had passed his ninetieth year and who was well known as a geologist and inventor, and whose long career was an active and unique one. While a portion of his life was spent in New York city, the greater part of it was passed at Watertown or the vicinity, where he did most of his scientific work and developed a number of important ideas in inventions. It was here that he, with George Paddock, built a mill at Natural Dam, and inaugurated the process of grinding iron ore into paint, which was then done for the first time. The paint mill was changed into a talc mill, and again Daniel Minthorn was the pioneer of another new industry, for no one before him had ever ground talc. He was also one of the first to engage in the business of making daguerreotypes, the lens used by him having been made by himself from an old pair of spectacles. Like many a genius before him, his inventive faculties were developed at the expense of his business acumen; and while others made money from his inventions, he remained poor. His literary work was principally in the line of geology.

What is said to be the first commercial use for the X-rays has been discovered by a dentist of Cincinnati, Ohio, Dr. J. V. Cavans, who has found the rays available for the tanning of leather. Before making any announcement of the new process, the doctor says he has thoroughly satisfied himself of its success in every particular. Samples of the new leather have been tested by experts, and it is said they have universally been pronounced equal to that tanned in the old way in every respect. The old method of tanning leather has been in use from time immemorial, and the treatment has extended over a period of over five months. The greater part of this time is consumed in the tanning liquor, and the capacity of the tannery is often limited to the space to be had for the necessary vats. Because of the great amount of room demanded, the erection of a building for this purpose is necessarily expensive. With the new process, however, this is all changed, for no vats are required for storage of skins in soak, and a great number of skins may be treated in a small establishment. In following Dr. Cavans' method, the skins are soaked, as at present, in lime for the separation of the fibers and the removal of the hair. This usually requires about four days, after which the skins are soaked for about two hours in a solution which is part of the doctor's process, and then they are exposed to the X-rays for fifteen or twenty minutes, when they are said to be as completely tanned as a hide which has been four months in the vats. By using X-ray lamps of the most recent construction, it is said to be possible to treat a number of the skins at one time, thus bringing the cost of the application down to a minimum. This method reduces the process from one of four months to four days, and cuts down the cost by about 75 per cent. Furthermore, a tannery by the X-ray method can be erected for one-quarter the cost of one like those in use at present. Dr. Cavans' method dispenses with much of the skilled labor which is now required.