

east, and continues on for more than five hundred miles to its union with the Missouri near the boundary line between Montana and Dakota. It is up this stream we proceed in entering the park, crossing the boundary line at the mouth of Gardiner river, one of its smallest tributaries. To describe a complete trip through this enchanted region, or to call attention in detail to all the scenes of beauty and objects of wonder, would require a large volume. The first object of special interest is the

MAMMOTH HOT SPRINGS

of Gardiner river, near which the Yellowstone National Park Improvement Co. is erecting an immense hotel to cost \$200,000. They are situated on the west bank of Gardiner river, on the side of White Mountain, and extend in terraces nearly 1,000 feet above the stream, the most active being at the top. In pouring down the mountain sides the water has left calcareous deposits, building up huge bowls or reservoirs. The steep hill for nearly a mile is thickly incrust-ed, and though covered with a growth of cedar and pine trees, and somewhat decomposed, shows the same wonderful architecture as the active springs above. There the white deposits give them the appearance of a frozen cascade. The step-like terraces are covered with basins, varying in height from a few inches to eight feet, and as the water flows from one down to another it loses a portion of its heat, and the bather can select a pool with any temperature that may meet his idea of health and comfort. The broad, flat terrace at the top is some two hundred yards in diameter, and covered with these basins, many of them in a state of decay. The largest springs are here, the most extensive one being near the edge of the terrace. It is twenty-five by forty feet in diameter, and the water is so "perfectly transparent that one can look down into the beautiful ultramarine depth to the bottom of the basin. The sides of the basin are ornamented with coral-like forms, with a great variety of shades, from pure white to a bright cream-yellow, and the blue sky, reflected in the transparent waters, gives an azure tint to the whole which surpasses all art. Underneath the sides of many of these pools are rows of stalactites, of all sizes, many of them exquisitely ornamented, formed by the dripping of the water over the margins of the basins." The sculpturing is by no means the chief beauty, for the deposit is adorned with a wonderful variety of delicate and artistically-arranged colors. "The mineral-charged fluid lays down pavements here and there of all the shades, from bright scarlet to rose-tint, beautiful layers of bright sulphur-yellow, interspersed with tints of green." The extent and variety of these great springs is wonderful. Their deposit covers a total area of two square miles, and only in New Zealand can anything be found approaching them in magnitude. The water is very beneficial to invalids, who bathe in the pools or in bath-houses near by.

MIDDLE GARDINER AND RUSTIC FALLS.

Many other scenes that evoke the deepest admiration are to be found in this vicinity, the greatest being the falls of Middle Gardiner, which descend 300 feet in the form of a cascade, 100 feet being in a single plunge. The Rustic falls, also, of West Gardiner, are entrancing, and are situated at the entrance of a beautiful canyon. The water falls sixty feet over a rock slightly

curved and scalloped on the margin, breaking into peculiar and fantastic forms.

Passing over towards Madison river we come to

OBISDIAN CLIFF,

composed of a species of lava called volcanic glass. It is of a deep, clear, beautiful black, with here and there fine specimens of red. The road is quarried from the edge of the cliff, and is entirely built on glass. Continuing on past the Lake of the Woods, through Norris and Monument geyser basins, and by Gibbon falls and canyon, we come to the

LOWER GEYSER BASIN,

on Fire Hole river. Here the chief attraction is Fountain geyser, with a crater twenty-five feet in diameter, and an outside circumference of 150 feet. This is usually full of transparent water, and the visitor stands on the brink and gazes far down into its depth, beholding a fairy palace sparkling with gems of the most brilliant colors. Suddenly he hears and feels heavy thuds beneath his feet, struggles of the imprisoned waters below to break their bonds. He hastens away, and at a convenient distance turns to witness a great column of water thrown sixty feet into the air. The length of activity is about one hour, and then all is quiet for five hours, when the play is resumed. Near by are the mud or paint-pots, covering an area of seventy by forty feet, one end having a pink hue, while the other is snowy white. These are constantly agitated, and throw up little jets of mud that fall in beautiful rings, only to be broken in another instant by a second eruption. A few smaller geysers and burning pools complete the attractions here, with the exception of Fairy falls near by, where a small stream leaps down a perpendicular height of 250 feet. Some four miles up Fire Hole we come to the Middle Geyser Basin, popularly known as Devil's, or

HELL'S HALF ACRE.

Here are to be found the grandest hot springs on the globe. Of the largest Professor Hayden says: "It seems to have broken out close by the river, and to have continually enlarged its orifice by the breaking down of its sides. It evidently commenced on the east side, and the continued wear of the under side of the crust, on the west side, has caused the margin to fall in until the aperture, at least 250 feet in diameter, has been formed, with walls or sides twenty to thirty feet high, showing the laminae of deposition perfectly. The water is intensely agitated all the time, boiling like a cauldron, from which a vast column of steam is ever rising, filling the orifice. As the passing breeze sweeps it away for a moment, one looks down into this terrible, seething pit with terror." The Sheridan geyser is another one of the attractions. It was so named because it made its first known eruption in 1881, at the time General Sheridan was passing through the basin. Until then it had been simply a spring, but little inferior in size to the one just described. It suddenly spouted up a column of water about seventy feet in diameter, to the height of 300 feet. This display continued several minutes, and, by the fortunate ones who witnessed it, was pronounced the grandest sight in the park.

Going five miles farther up Fire Hole we come to the celebrated

UPPER GEYSER BASIN,

and here it seems almost impossible to give a detailed description of the many scenes of wonder. This is the great home of the geyser, though hot

springs and geysers are scattered from one end of the park to the other. Professor Hayden estimates 2,000 of them in these basins on Fire Hole river, and 10,000 in the whole park. William L. Marshall thus speaks of these exhibitions of natural forces. "Here are more geysers than in all the world beside, and they spout columns of boiling hot water, of sizes varying with the dimensions of their orifices, from a few inches to twenty feet in diameter, and to heights ranging all the way from ten or fifteen up to 250 or 275 feet, the eruptions being accompanied by a constant succession of miniature earthquakes, by a terrible noise like almost continuous underground thunder, and by the evolution of immense masses of steam, which tower hundreds of feet above the water. The subterranean explosions, from twenty to seventy a minute, sounding and jarring the ground like a heavy artillery duel, manifest themselves in mighty pulsations along the column, shooting it upwards and outwards in jets, rising to ever-varying heights, and constantly dividing and subdividing, and shivering into milk-white spray."

"A geyser eruption is not at all like the play of an artificial fountain, in which the water is pushed up by pressure to a uniform height, or if made to vary must do so with a regularity which soon becomes wearisome, but is like a cataract of crystal-clear, boiling-hot water—not falling in despair of resistance to gravity, but, as if instinct with life, leaping towards heaven, shivering upwards (precisely as a cataract does downwards) into rockets of milk-white spray, each as it ceases to rise emitting a little puff of steam, which proclaims what was the force which lifted it, and which now, like the soul deserting the body, leaves it, no longer able to triumph over gravity, but, unsupported, to fall to the steaming mound below in showers of shining pearls and flashing diamonds, while the central portions of the column drop down in immense volumes that strike the mound with a roar like a cataract, or like the thunder of distant surf. Every instant the column is changing its height and shape, as the mighty and mysterious forces of the under world, shaking the mountains in their struggles for freedom, pulsate along it; and it is always enveloped and surmounted by vast banks and lofty pillars of steam, ever swaying with the wind, constantly assuming fantastic forms, and crowned and fringed with rainbows. These indescribably magnificent displays occur with some geysers at fixed periods, as in the case of Old Faithful, which spouts from an orifice seventy feet long by two feet wide, every sixty-five minutes, its eruptions lasting from four to six minutes. It is the only large geyser known in the world which spouts so frequently and with such unfailing regularity. In more than one hundred eruptions of it, which I witnessed during my two visits to the park in 1873 and 1875, I never knew it to be more than three minutes behind its appointed time. Most of the greatest geysers, however, spout at very irregular intervals, varying from three or four hours to several days, or even two or three weeks, their eruptions lasting from fifteen or twenty minutes to two or three hours, and sometimes even as long as nine hours."

"No geyser spouts constantly, though some of the small ones spout most of the time. Between eruptions, some pour out from their beautifully ornamented craters great puffs of steam, like immense high-pressure engines, little jets of scalding spray being constantly thrown to the top of