

ARCHBALD'S FAMOUS GLACIAL POT-HOLE

LARGEST OF ITS KIND IN THE WORLD.

How the Marvelous Natural Curiosity Was Formed and How Discovered—Theories of the Geologists. A Time When Ice Must Have Been Plentiful.

From the Archibald Column. In the golden summertime there is no more popular place in this locality than the glacial pot-hole at the Ridge. Scarcely a day passes that does not bring its quota of visitors to the great marvel of nature. Now is this surprising in view of the fact that the Archibald pot-hole is the largest in the world, surpassing in size even the more noted pot-holes of Switzerland and other parts of the world. It is so long since it was discovered and so few know how geologists account for its formation that the brief sketch given herewith will have at least an instructive value.

The pot-hole is located on the Hackley tract in Luzerne county. It was discovered in April, 1883, by Patrick Mahady, a miner employed by Jones, Simpson & Company. The men were opening a chamber in an airway and they struck the pot-hole after discharging a blast. They immediately reported to the operators that they had found an outcrop, but the latter knew this could not be so and continued to prosecute work at that point. Large round stones and gravel began to pour into the mine, and after moving great quantities of this the rim of the hole was found. The pot-hole was then bratticed and used as an air shaft. Negotiations were begun for the purchase of the ground surrounding the pot-hole. Colonel Hackley, the owner, declined to sell, but he appropriated \$500 for the preservation of the pot-hole in the interests of science. A substantial stone wall was built around the hole and the grounds were otherwise improved under the direction of the late Edward Jones, an enthusiastic student of geology who was particularly interested in this pot-hole because it was uncovered by some of his employees.

OTHER HOLES FOUND. Soon after the discovery of this another and larger pot-hole was found about 500 feet to the northeast. This has not been uncovered because of the effect it would have on the mine which is still in operation. There are other but much smaller holes in other parts of the borough, especially along White Oak creek, but the one uncovered at the Ridge is the most important of all. The pot-hole is at the foot of a precipitous wooded hill. The hole is not round. The shape is rather more oblong, and the walls are worn smooth. The depth is about forty-five feet; its greatest diameter is twenty feet and its least diameter is eighteen feet. When it was discovered it was partially filled with stones varying in weight from a few grains to twenty pounds. They were worn almost perfectly round.

In the winter of 1885 Jones, Simpson & Company informed State Geologist J. P. Lesley of the discovery of the pot-hole, and in a letter in reply Mr. Lesley said: "The Archibald discovery is a fine case of a well known phenomenon called a glacial pot-hole. There is a public garden in the city of Lucerne, Switzerland, where five or six of these are kept open for the amusement and instruction of the public. When they were cleaned out, a number of the rounded stones (some of large size) were left in them so that people could see how the holes are made. The glaciers of the Jungfrau, Wetterhorn and other mountains once flowed down over the city of Lucerne and far out into the plain of Switzerland, and even reached the Jura mountains a hundred miles distant. This was in the cold age of the world, immediately preceding the appearance of mankind. All the Alpine glaciers have now shrunk back into the higher valleys, leaving behind them millions of rocks of great kinds on the surface of Switzerland, and many thousands of pot-holes bored into its surface, wherever some of these stones were rolling round and round by the melting waters.

GLACIAL EFFECT. "The traveler on any of the Alpine glaciers has an opportunity to see how these holes were made, because similar ones are being made today. The surface ice of a glacier melts under the hot sunshine, flows over the surface of the ice, and plunges into crevices to the hot bed of the valley down which the glacier is moving. These waterfalls make deep pot-holes wherever they keep rocks twirling round in depressions of the valley bed.

"When a pot-hole is finished by a change in the location of the water-fall, it gets filled with smaller rounded boulders, gravel and sand. If there were any horizontal coal beds not far underneath the bed of an Alpine valley, such a coal bed would be sure to have some or more glacial pot-holes in it, perhaps going clear through it, filled with gravel.

"Now in that cold age, Canada, New England, New York, Northern New Jersey and Northern Pennsylvania down to a line stretching from Olean through Ralston, Berwick, and Eckley to Belvidere, on the Delaware river, and from Belvidere Ambours were entirely covered with a solid continuous sheet of ice, in some places 5,000 feet thick (in New Hampshire 6,000 feet) moving southward carrying rocks of all kinds and sizes, plowing and scratching the surface of the country, and making pot-holes of various depths from 10 to 70 and 80 feet, most of which are now concealed by a thick covering of drift, that is, the gravel, sand and clay which the ice carried forward as it advanced, and left behind it when it melted.

"Many of these pot-holes have been accidentally uncovered (like yours) and have been always found filled with gravel of a foreign origin, no matter what the formation was in which the pot-holes were excavated. In some, exposed by cutting a mill race west of Stroudsburg, in Monroe county, at about 1,500 feet. It was deep enough to cross the Kittatinny mountains at Delaware Water Gap, where it has left on the top of the mountain large masses of limestone torn off from the outcrop in Godfrey's ridge near Stroudsburg, and therefore carried up by the ice a thousand feet. The ice was thick enough to move over the great highlands of the Pocono Mountain between Stroudsburg and Stroudsburg more than 2,000 feet above the sea. I have no doubt that the ice at Archibald was at least 2,000 feet thick, and that it carried fragments of your coal measure rocks, and of anthracite coal itself from some 3,000 feet above the sea. It is possible at that time, but covered up with drift now) from the bottom of the Lackawanna valley to the top of Bald Mountain, and that they now lie scattered over the wilderness highland of the headwaters of the Lehigh river, and that they will be discovered there, if ever railroad or other cuttings are made through the drift ridges on that table land.

"It would be well worth your while to examine closely the cuts along the line of the Delaware, Lackawanna & Western Railroad for bits of anthracite coal and conglomerate which have been carried from Carbonate and Archibald, and left there by the ice. Your discovery happens to be one of the very finest illustrations of the subject which we have seen. The good fortune to encounter."

ANOTHER OPINION. Prof. J. C. Branner, director of the geological survey of Arkansas, has also written about the pot-hole. He says: "These gigantic pot-holes at Archibald were formed by a stream of considerable volume falling from an elevation, for we know of no ordinary stream capable of whirling the stones into the bottom of this hole, without great velocity. The whole process by which this hole was made may be illustrated by placing in a smooth glass tumbler a few angular pebbles and then pouring into it a stream of water from a pitcher held at a height not great enough to throw the pebbles from it. If the water is poured in a regular stream, the pebbles will be seen to dance about and to be thrown constantly against the sides of the glass, at various angles and with more or less force. If instead of a pitcher of water a constant stream is allowed to fall into the glass for a week, or more, it will be found at the end of that time that the inside surface is dulled by the wearing and scratching of the pebbles and the pebbles themselves will have their sharp angles somewhat rounded. The height which the water fell must necessarily be more or less a matter of conjecture. It is clear that the height could not have been so great as to dissipate the falling water into spray, for it would thus have lost to a great degree its wearing power. Neither do the conditions require that the water should have fallen perpendicularly; but simply that it should have had force to keep in motion the grinding material inside the hole.

"The fact that ice marks occur on the summits of the hills and mountains in this vicinity shows that the ice was at one time not less than 1,500 feet thick, immediately above the pot-hole, and 1,800 feet thick above the village of Archibald, while the probabilities are that it was considerably thicker at the

Sunday-School Lesson for July 16.

The Hebrews in the Fiery Furnace.

DAN. III: 14-28.

BY J. E. GILBERT, D. D., LL. D.,

Secretary of American Society of Religious Education.

CONTEXT.—About a year after Daniel had been imported into the king's service he had succeeded in exercising his religious freedom as a proselyte. Nebuchadnezzar had a dream which he was unable to recall and the wise men were summoned to make it known to him. They were unable to do so, whereupon an order was issued condemning them to death. That decree involved the life of Daniel, who was summoned to the king's presence and appeared at court and obtained from the king a respite, promising that he would divulge the secret. After much prayer God revealed the mystery to him. His interpretation, which he promptly gave to the king, for this service he was well rewarded. Later, having increased in power, Nebuchadnezzar set up a golden image, which he commanded all his subjects to worship. Daniel is not mentioned in the case, but his associates did not obey. The king was wroth and prepared Nebuchadnezzar ordered the strongest men in his army to bind Shadrach, Meshach and Abed-nego and to cast them into the furnace. Why strongest men? Did he fear these three Hebrew youths? It must have been that he expected some supernatural power might be exerted for them.

EXECUTION (Verses 21 and 23).—The king's orders were obeyed. There was no appeal. The life of every man in his hands was in the hands of the king. How strange that absolute monarchy could ever be set up! How strange that it could so long be maintained! What gladness might be in the hearts of the king, where, save among savage tribes, does such government now exist! The three men were securely bound, as if they were iron. They were taken to the place of execution. The doors were shut upon them, and they were cast into the midst of the heated furnace, falling down upon the pavement helpless. So intense was the heat that the executioners, though standing without, were overcome, and falling prostrate at the entrance, they perished. Three men lying bound with their arms outstretched, their feet being dead without! Such was the result of the king's mandate. Already his plans had miscarried. Those who were to die were safe, and he must wait for explanations in future disclosures.

SURPRISE (Verses 24 and 25).—The scene in the furnace soon changed. The men, who at first fell down bound, were now seen to be standing. The king, who was in full view of the king, probably because some transparent medium had been provided that officers might watch the progress of death. Here, then, is victory, the righteous triumphing over those who believed in the power of the king. A fourth person was seen walking in the midst of the fire. Who was he? The executioners were astounded. This strange spectacle startled him. He seemed to be moved by an unearthly influence. He called his counselors and inquired of them what he had seen. The affirmative puzzled him. "The form of the fourth is like the Sons of God," he said, or more properly translated, "son of the gods." He had no knowledge of Christ who was doubtless the person seen, but he thought the form had an unearthly appearance, as of one under all other men.

CONCLUSION.—The chief interest of the lesson centers in the Hebrews. They exhibited the sexual attributes of the triumph of faith. It was because they believed in God that they dared to answer the king, saying that they would be delivered, but they delivered them from the furnace. It was by faith that they were supported, able to come forth unharmed. The reward of their faith was not limited to themselves, but it was a blessing to the king, led him to issue another decree in which the religion of the condemned and saved men was commended. God glorified the men whom he had saved, and he who stands for the right is protected by the Almighty, and there goes forth from him the faith and courage of men who believe in all times and lands is men who love God and fearlessly stand for Him under all other men.

DELIVERANCE (Verses 26 and 27).—As might have been expected the heart of Nebuchadnezzar was greatly moved by these strange events. Approaching the mouth of the furnace he called to the Hebrews, speaking their names, but addressing them as "servants of the most high God." This expression indicated that he had repented of the men, but reverence for Jehovah recognized now as superior to the god of Babylon. All through the ancient world there was faith in many deities, and men only sought to know which was mightiest. The king had been compelled to confess, through this remarkable interposition, that the god of the Hebrews was entitled to the honor of surpassing majesty and power. Shadrach, Meshach and Abed-nego came forth. The princes, governors and officers of the court, gathered together and looked upon them with amazement. Their bodies were unharmed. No hair of their head was singed. The garments were unchanged. Not even the smell of fire had passed upon them. They had been completely delivered, and stood in the presence of the king and his court, and before their sentence, a proof that their confidence had not been misplaced.

CONFESSION (Verse 28).—Beginning with the appearance of the four men in the fiery furnace new thoughts and feelings struggled in the mind and heart of Nebuchadnezzar. He had seen the conflict caused and he was borne on toward better purposes than he had previously cherished. And when the three Hebrews stood before him unharmed, he was longer to repress the convictions forced upon him by what had occurred. His exclamation in his opening clause indicated to what excellent views he had advanced. "Blessed be the God of Shadrach, Meshach and Abed-nego!" He glorified the being whom he had before challenged. He honored the men whom he would have destroyed. He honored them because they had fearlessly refused to do what their consciences condemned, and because they trusted in Him in whom they believed. He honored their God because He had delivered His servants. It was a most remarkable instance in which the faith and courage of men had secured the public display of Divine power, resulting in the open and glad confession of one who worshipped other gods (Matt. v: 19).

ANOTHER ACTOR AND WORKING IT UP on your script now over that. It has been made when the ice was at its greatest thickness. It seems more consistent with what we may reasonably believe were the conditions of those times, to suppose that toward the close of the ice epoch the glaciers were melted partially by the sun's melting the ice during the period of retreat produced many and considerable streams over its surface and bound into its crevices and wore out channels in the rock beneath."

REPLY (Verses 16 to 18).—Nebuchadnezzar misjudged the men who stood before him. He was wroth and he would change their purpose. Silent when he questioned they were not slow to respond when summoned. There was, however, great calmness in their words, and a sure confidence to the person addressed. They first declared that they were not careful, that it was not anxious or concerned. They did not intend to consider. Their minds were already settled. There was no occasion to wait for the music to learn their decision (Matt. x: 19). They were confident that their God was able to deliver them from the fiery furnace, and that He would deliver them, a sub-time exhibition of faith (Heb. xi: 34), worthy to be recorded for the comfort of after generations. And yet, if God did not deliver them, their course was to be unchangeable. They were ready to die, but they would not worship the king's image, nor would they worship his gods, nor would they worship his image. Rarely in all history have men faced an issue with more courage. They were ready to be cherished as the martyrs of moral heroes, destined to live through all time. What matters the outcome in such a contest? When this man of such stuff? For once the king beholds those who fear him not.

COMMAND (Verses 19 and 20).—Such language, addressed to Nebuchadnezzar, was a great affront to him. He was not great enough to throw the pebbles from it. If the water is poured in a regular stream, the pebbles will be seen to dance about and to be thrown constantly against the sides of the glass, at various angles and with more or less force. If instead of a pitcher of water a constant stream is allowed to fall into the glass for a week, or more, it will be found at the end of that time that the inside surface is dulled by the wearing and scratching of the pebbles and the pebbles themselves will have their sharp angles somewhat rounded. The height which the water fell must necessarily be more or less a matter of conjecture. It is clear that the height could not have been so great as to dissipate the falling water into spray, for it would thus have lost to a great degree its wearing power. Neither do the conditions require that the water should have fallen perpendicularly; but simply that it should have had force to keep in motion the grinding material inside the hole.

AN AWFUL ROAR. When the pot-hole was discovered the stones and gravel it contained rested on a cone of coal. Mine Foreman James M. Eaton's attention was called to it and he ordered the miners to blast the coal. When this was done the stone came tumbling into the air with such an awful roar that the miners who had gathered near thought the mountain was coming in on them. Some of them left the scene, or fled in terror. The debris that filled the pot-hole was removed by a gang of men under the direction of Hon. M. M. Gilroy. Souvenirs of the discovery in the shape of round stones were very common here, and are still preserved in many homes in Luzerne county.

JARGON OF THE STAGE. Some English Examples That Are as Obscure as the Lingo of the American Baseball Field. From the London Daily Mail.

Pretty nearly every profession boasts a vocabulary of its own, and the theatrical profession is not least boastful in this matter. There is a neatness and directness about the vocabulary of the stage which does not characterize that of any other institution. What, for instance, could be more directly impressive of the volume of an evening's audience or the receipts to accrue therefrom than the phrase "playing to the gas"? It is used in the general sense in reference to small audiences, but strictly it means that an audience was only large enough to render receipts sufficient to pay the bill for the evening's lighting.

"Playing to the gas" is a hideous experience through which probably every actor passes at some time in his career and he not unreasonably hates it. He would infinitely rather play to a "house full of paper." The latter phrase means an audience admitted mostly by free passes, and the expression probably takes its origin from the fact that it is customary for theatrical managers to send free passes to the dramatic critics of the press. The phrase of "stealing thunder" is not prishable under any penal code, but it is a misdemeanor which no respectable theatrical company should allow to go un punished. It is not, however, so dangerous a crime as one might fancy. In prosy English it is the offense of accepting an acknowledgment as your own the applause due to

another actor and working it up on your script now over that. It has been made when the ice was at its greatest thickness. It seems more consistent with what we may reasonably believe were the conditions of those times, to suppose that toward the close of the ice epoch the glaciers were melted partially by the sun's melting the ice during the period of retreat produced many and considerable streams over its surface and bound into its crevices and wore out channels in the rock beneath."

FIRST SILK HAT. Its Wearer Arrested for Breach of Peace. From the Hatters' Gazette.

January 15, 1897, was the date fixed by Mr. Hetherington for his first appearance in public with the new hat, the silk hat of today. He believed that he would create a sensation, but he was not prepared for the commotion which followed. It was with no little trepidation that, about 11 o'clock in the forenoon, Mr. Hetherington emerged from his shop in the Strand. His family advised against it, but he was determined, and forth he sallied. The Strand, as now, was one of the busy streets of London, and Mr. Hetherington had not walked ten feet before merchants and others attracted by the unusual sight, stopped and gazed in wonder. Mr. Hetherington, however, moved on, but men who had only stopped to look, now followed after him, and in less time than it takes to tell the street was crowded with a howling mob. Those on the outskirts of the crowd did not know the nature of the trouble, if there was any, but they helped to swell the din. How Mr. Hetherington fared, however, is best told by the journals of that date, whose pages have been searched by the tailors and cutters' special commissioner. One gazette gave this account of the remarkable event: "John Hetherington, haberdasher of the Strand, was arraigned before the lord mayor yesterday on a charge of breach of the peace and inciting to riot, and was required to give bond in the sum of £200. It was in evidence that Mr. Hetherington, who is well connected, appeared upon his head what he called a silk hat which was having a shing bust, and calculated to frighten the people. As a matter of fact the officers of the crown stated that several women fainted at the unusual sight, while children screamed, dogs yelped, and a young son of Cordwainer Thomas, who was returning from a chandler's shop, was thrown down by the crowd which had collected, and had his right arm broken. For these reasons the defendant was seized by the guards and taken before the lord mayor. In extension of his crime, defendant claimed that he had not violated any law of the kingdom, but was merely exercising a right to appear in a head-dress of his own design—a right not denied to any Englishman."

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