

as he judged by appearances, two or three avenues led off in different directions. About a hundred feet from the top a cataract from the side of the pit went rushing down the abyss, and, as he descended by the side of the falling water and in the midst of the spray, he felt some apprehension that his light would be extinguished, but his care prevented this. He was landed at the bottom of the pit, a hundred and ninety feet from the top. He found it almost perfectly circular, about eighteen feet in diameter, with a small opening at one point, leading to a fine chamber of no great extent. He found on the floor beautiful specimens of black siliceous of immense size, vastly larger than were ever discovered in any other part of the Mammoth Cave, and also a multitude of exquisite formation, as pure and white as virgin snow. Making himself heard, with great effort, by his friends, he at length asked them to pull him partly up, intending to stop on the way and explore a cave that he had observed opening about forty feet above the bottom of the pit. Reaching the mouth of the cave, he swung himself with much exertion into it, and holding the end of the rope in his hand, he incautiously let it go, and it swung out apparently beyond his reach. The situation was a fearful one, and his friends above could do nothing for him. Soon, however, he made a hook of the end of his lamp, and, by extending himself as far over the verge as possible without falling, he succeeded in securing the end of the rope. Fastening it to a rock, he followed the avenue 150 or 200 yards to a point where he found it blocked by an impassable avalanche of rock and earth. Returning to the mouth of this avenue, he beheld an exactly similar mouth of another on the opposite side of the pit; but, not being able to swing himself into it, he refastened the rope around his body, suspended himself again over the abyss, and shouted to his friends to raise him to the top. The pull was an exceedingly severe one, and the rope, being ill adjusted round his body, gave him the most excruciating pain. But soon his pain was forgotten in a new and dreadful peril. When he was ninety feet from the mouth of the pit, and one hundred from the bottom, swaying and swinging in mid-air, he heard rapid and excited words of horror and alarm above, and soon learned that the rope by which he was upheld had taken fire from the friction of the timber over which it passed. Several moments of awful suspense to those above, and still more awful to him below, ensued. To them and him a fatal and instant catastrophe seemed inevitable. But the fire was extinguished with a bottle of water belonging to himself, and then the party above, though almost exhausted by their labours, succeeded in drawing him to the top. He was as calm and self-possessed as upon his entrance into the pit; but all his companions, overcome by fatigue, sank down upon the ground, and his friend Professor Wright, from over-exertion and excitement, fainted and remained for a time insensible. The young adventurer left his name carved in the depth of the Maelstrom—the name of the first and only person that ever gazed upon its mysteries. —*New York Evening Post.*

—Mr. W. C. Bond, Director of the Harvard College Observatory, publishes the following statements and predictions relative to the Comet, whose appearance is so splendid a feature in the nocturnal heavens at this time:

"Donati's Comet increases rapidly in size and brilliancy. It will be nearest the earth on the 9th instant, at which time its brilliancy will be nearly three times as great as on the 23rd of September, and its distance from us about fifty two millions of miles.

"According to Mr. Hall's computation, the tail of this Comet, on the 23rd ultimo, extended to the length of fifteen millions of miles. The nucleus will be nearest the earth's orbit on the 20th.

"Some confusion seems to prevail in regard to there being two comets, similar in appearance, now visible to the naked eye, but such is not the case. Donati's, which is seen in the northwest after sunset, is the same which has been seen in the northeast before sunrise in the morning. This is owing to the considerable northern declination of the comet, with a right ascension differing but little from that of the sun. I mention this because I have had several letters from different parts of the country, making the inquiry whether there are two comets now to be seen by the naked eye.

"Eucke's Comet is barely visible to the naked eye; Tuttle's Third Comet of 1858, can now be seen only with the assistance of a telescope." As Donati's comet, which has been so brilliant, is withdrawing from us, this new visitor from the wondrous, far away regions of space will be watched with interest. It can now be seen in the constellation Pegasus. This constellation is in range of a line drawn from the two pointers in the Great Dipper, through the North Star, and is the about as far from that body as Arcturus.

Professor Kingdon, of the Provincial Observatory, Toronto, in a published letter, thus refers to Donati's Comet: "The propriety of calling this comet after Donati is founded on the principle of nomenclature that that name is best which embodies fact, and does not imply a theory which may be afterwards overthrown. Thus, as long as the identity of this comet with any formerly seen, remains a matter of mere conjecture, it will continue to be called after Dr. Donati, who (during its present visit to the sun) first discovered it at Florence on the 26th July 1858.

"It was then seen about 70 degrees east from the sun, and with a declination about 14 degrees further north, and was found to be moving westwards, or towards its perihelion. After passing that point it reappeared early in September.

"When the comet was first seen by Donati, it was by many supposed to be the expected comet of Charles V., whose arrival at its perihelion was predicted by Hind, on the 2nd of August, 1858, within a limit of two years. The fact of the arrival of Donati's so near the time predicted for Charles V.'s comet was certainly a presumption in favor of the two being identical, but unfortunately there is this fatal objection to the opinion that the two comets are moving in opposite directions; that of Donati being retrograde, while that of Charles V. was direct.

"The identity of a comet with one seen at a former epoch is inferred from the general resemblance of what are termed the elements of the orbits. These elements are certain numbers which define the position, form and magnitude of the orbit and the epoch at which the body passes its perihelion, and also supply the means of determining the periodic time or the time that elapses between two consecutive perihelion passages. The elements of any comet that has formerly been seen ought then to inform us when it will arrive again, and to enable us to determine, when it does arrive, whether it is in fact the same or some other comet that has not been seen before.

"The elements either of a planet or a comet are not directly observed, but are calculated from at least three but usually from several observed geocentric positions of the body with the corresponding times. Some positions of the body are better adapted than others for determining these elements correctly, and for a planet these can generally be employed; but as the visibility of a comet is usually of short duration, it is not generally possible to use any choice in the selection of the best positions, and hence another difficulty with which astronomers have to contend. Much more might be written on this subject, but I think I have said enough to show, in some measure, how great the difficulties are that attend the researches of astronomers on the question of new comets, and that it is no discredit to their skill, or to the science of astronomy, that they cannot arrive at conclusions without the possession of the facts from which only such conclusions can be legitimately derived."

—(*Upper Canada Journal of Education*)

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