

ROUND THE MOON.

CHAPTER XI.

LUNAR LANDSCAPE.

At half-past two in the morning, the projectile was over the thirteenth lunar parallel and at the effective distance of 500 miles, reduced by the glasses to five. It still seemed impossible, however, that it could ever touch any part of the disc.

Michel Ardan was watching heat the president, when he noticed long white lines, vividly lighted up by the direct rays of the sun. It was a succession of luminous furrows, very different from the usual appearance of Copernicus long before they ran parallel with each other.

"Michel, with his usual readiness, hastened to explain. "Look there! Look there! Cultivated fields," replied Nichol, shrugging his shoulders.

"Ploughed; at all events," retorted Michel Ardan; "but what laborers those Selenites must be, and what giant oxen they must harness to their plough to cut such furrows!"

"They are not furrows," said Barbicane; "they are rifts." "Rifts? rifts!" replied Michel Ardan; "but what do you mean by rifts in the scientific world?"

Barbicane immediately enlightened his companion as to what he knew about lunar rifts. He knew that they were a kind of furrow found on every part of the disc which was not mountainous; that these furrows, generally isolated, measured from 400 to 500 leagues in length; that their breadth varied from 1,000 to 1,500 yards; and that their borders were strictly parallel; but he knew nothing more either of their formation or their nature.

Barbicane, through his glasses, observed these rifts with great attention. He noticed that their borders were formed of steep declivities; that they were long parallel ramparts, and with some small amount of imagination he might have admitted the existence of long lines of fortifications, raised by Selenite engineers. Of these different rifts some were perfectly straight, as if cut by a line; others were slightly curved, though still keeping their borders parallel; some crossed each other, some cut through craters; here they wound through ordinary craters, such as Ptolemaeus or Petavius; there they wound through the sea, such as the Sea of Serenity.

"What origin do they attribute to these rifts? That is a question difficult to solve. They are certainly anterior to the formation of craters and circles, for several have introduced themselves by breaking through their circular ramparts. Thus it may be that, contemporary with the latter geological epochs, they are due to the expansion of natural forces.

But the projectile had now attained the 40° of lunar lat., at a distance not exceeding 400 miles. Through the glasses objects appeared to be only four miles distant.

At this point, under their feet, rose Mount Helicon, 1,620 feet high, and around about the left rose moderate elevations, enclosing a small portion of the "Sea of Rains," under the name of the Gulf of Iris. The terrestrial atmosphere would have to be one hundred and seventy times more transparent than it is, to allow astronomers to make perfect observations on the moon's surface; but in the world in which the projectile floated no fluid intervened itself between the eye of the observer and the object observed. And so, Barbicane found himself carried to a greater distance than the most powerful telescopes had ever done before, either that of Lord Rosse or that of the Rocky Mountains. He was, therefore, under extremely favorable conditions for solving that question of the habitability of the moon; but the solution itself escaped him; he could distinguish nothing but desert beds, immense plains, and towards the north, arid mountains. Not a work betrayed the hand of man; not a ruin marked his course; not a group of animals was to be seen indicating life, even in a inferior degree. In no part was there an appearance of vegetation. Of the three kingdoms which share the terrestrial globe between them, one alone was represented on the lunar, and that the mineral.

the Sea of Rains was at length passed. The mountains of Condamine and Fontaine remained—one on the right, the other on the left. That part of the disc beginning with 60° was becoming quite mountainous. The glasses brought them to within two miles, less than that separating the summit of Mont Blanc from the level of the sea. The whole region was bristling with spikes and circles. Towards the 60° Philotas stood predominant at a height of 5,500 feet with its elliptical crater, and seen from this distance, the disc showed a very fantastical appearance. Landscapes were presented to the eye under very different conditions from those on the earth, and also very inferior to them.

The moon having no atmosphere the consequences arising from the absence of this gaseous envelope have already been shown. No twilight on her surface; night following day and day following night with the suddenness of a lamp which is extinguished or a lighted amid profound darkness,—no transition from cold to heat, the temperature falling in an instant from boiling point to the cold of space.

Another consequence of this want of air is that absolute darkness reigns where the sun's rays do not penetrate. That which on earth is called diffusion of light, that luminous matter which the air holds in suspension, which creates the twilight and the daybreak, which produces the umbra and the penumbra, and all the magic of chiaroscuro, does not exist on the moon.

Hence the harshness of contrast, which only admit of two colors, black and white. If a Selenite were to shade his eyes from the sun's rays, the sky would seem absolutely black, and the stars would shine to him as on the darkest night. Judge of the impression produced on Barbicane and his three friends by this strange scene! Their eyes were confused. They could no longer grasp the respective distances of the different plains. A lunar landscape without the softening of the phenomena of chiaroscuro could not be rendered by an earthly landscape painter; it would be spots of ink on a white page—nothing more.

This aspect was not altered even when the projectile, at the height of 80°, was only separated from the moon by a distance of fifty-five miles; nor even when, at five in the morning, it passed at less than twenty-five miles from the mountain of Gioia, a distance reduced by the glasses to a quarter of a mile. It seemed as if the moon might be touched by the hand. It seemed indeed that, before long the projectile would not strike her, if only at the north pole, the brilliant arch of which was so distinctly visible on the black sky.

Michel Ardan wanted to open one of the scuttles and throw himself on the moon's surface. A very useless attempt; for the projectile could not attain any point whatever of the satellite, Michel, carried along by its motion, could not attain it either.

At that moment, at six o'clock the lunar soil appeared. The disc only presented to the traveler's gaze one half brilliantly lit up, whilst the other disappeared in the darkness. Suddenly the projectile passed the line of demarcation between intense light and absolute darkness, and was plunged into profound night.

The transition was so sudden, without attenuation of the luminous waves, that the orb seemed to have been extinguished by a powerful blow. In the interior, the obscurity was complete. They could not see each other. Hence the necessity of dispelling the darkness. However despondent Barbicane might be to husband the gas, the reserve of which was small, he was obliged to ask from a scuttles light, an oblique brilliancy which the sun then refused him.

"Well," said Michel Ardan, let us have breakfast. After a whole night of watching, it is fair to build ourselves up a little." Michel prepared the repast in a few minutes. But they ate for eating's sake, they drank without tasting, being borne away into gloomy space without their accustomed cortege of rays, felt a vague uneasiness at their hearts. The "strange" shadow so dear to Victor Hugo's pen burned them on all sides. But they talked over the interminable night of three hundred and fifty-four hours and a half, nearly fifteen days, out the law of physics has imposed on the inhabitants of the moon.

Barbicane gave his friends some explanation of the causes and the consequences of this curious phenomenon. Breakfast over, the observers returned to their post. They tried to see through the darkened scuttles by extinguishing all light in the projectile; but not a luminous spark made its way through the darkness.

One inexplicable fact preoccupied Barbicane. Why, having passed through in such a short distance of the moon—at about twenty-five miles only—the projectile had not fallen? If its speed had been enormous, he could have undertaken that the fall would not have taken place; but, with a relatively moderate speed, that resistance to the moon's attraction could not be explained. Was the projectile under some foreign influence? Did some kind of body retain it in the ether? It was quite evident that it could never reach any point of the moon. Whither was it going? Was it going farther from, or nearer, the disc? Was it being borne in that profound darkness through the infinity of space? How could they learn, how calculate, in the middle of this utter darkness may be imagined. All observation of the lunar disc was impossible. The constellations alone claimed all their attention.

years, by reason of the succession of equinoxes, will resign their part of popular stars, the one to Canopus in the southern hemisphere, the other to Vega in the northern. Imagining how it itself in the sublime infinity, amidst which the projectile was gravitating, like a new star created by the hand of man. From a natural cause, these constellations shone with a soft lustre; they did not twinkle, for there was no atmosphere which, by the intervention of its layers unequally dense and of different degrees of humidity, produces this scintillation. These stars were soft eyes, looking out into the dark night, amidst the silence of absolute space.

Long did the travelers stand mute, watching the constellated firmament, upon which the moon, like a vast screen, made an enormous black hole. But at length a painful sensation drew them from their watchings. This was an intense cold, which soon covered the inside of the glass of the scuttles with a thick coating of ice. The sun was no longer warming the projectile with its direct rays, and thus it was losing the heat stored up in its walls by degrees. This heat was rapidly evaporating into space by radiation, and a considerably lower temperature was the result.

The humidity of the interior was changed into ice upon contact with the glass, preventing all observation. Nichol consulted the thermometer and saw that it had fallen to seventeen degrees (centigrade) below zero. So that, in spite of the many reasons for economizing, Barbicane, after having begged light from the gas, was also obliged to beg for heat. The projectile's low temperature was no longer endurable. Its tenants would have been frozen to death.

"Well!" observed Michel, "we cannot reasonably complain of the monotony of our journey! What variety we have had, at least in temperature. Now we are blinded with light and saturated with heat, like the Indians of the Pampas! Now plunged into profound darkness, amidst the cold like the Esquimaux of the north pole. No, indeed! I have no right to complain; nature does wonders in our honor."

"But," asked Nichol, "what is the temperature outside?" "Exactly that of the planetary space," replied Barbicane. "Then," continued Michel Ardan, "would not this be the time to make the experiment which we dared not attempt, when we were drowned in the sun's rays?" "It is now or never," replied Barbicane, "for we are in a good position to verify the temperature of space, and see if Fourier or Pouillet's calculations are exact."

"In any case it is cold," said Michel. "See the steam of the interior is condensing on the glasses of the scuttles. If the fall continues, the vapor of our breath will fall in snow around us." "Let us prepare a thermometer," said Barbicane.

They may imagine that an ordinary thermometer would afford no result under the circumstances in which this instrument was to be exposed. The warmer would have been frozen in its fall, as below forty-two degrees below, it is no longer liquid. But Barbicane had furnished himself with a spirit thermometer on Wafferdin's system, which gives the minima of excessively low temperatures.

Before beginning the experiment, this instrument was compared with an ordinary one, and then Barbicane prepared to use it. "How shall we set about it?" asked Nichol. "Nothing is easier," replied Michel Ardan, who was never at a loss. "We open the scuttle rapidly; throw out the instrument; it follows the projectile with exemplary docility; and a quarter of an hour after, draw it in."

"With the hand?" asked Barbicane. "With the hand," replied Michel. "Well then, my friend, do not expose yourself," answered Barbicane, "for the hand that you draw in again will be nothing but a stimp frozen and deformed by the frightful cold." "Really?" "You will feel as if you had had a terrible burn, like that of iron at a white heat; for whether the heat leaves our bodies bristly or enters bristly, it is exactly the same thing. Besides, I am not at all certain that the objects we have thrown out are still following us."

"Why not?" asked Nichol. "Because, if we are passing through an atmosphere of the slightest density, these objects will be retarded. Again the darkness prevents our seeing if they still float around us. But in order not to expose ourselves to the loss of our thermometer, we will fasten it to the projectile, and can then more easily pull it back again."

Barbicane's advice was followed. The scuttle rapidly opened, Nichol threw out the instrument which was held by a short cord, so that it might be more easily drawn up. The scuttle had not been opened more than a second, but that second had sufficed to let in the most intense cold. "The devil!" exclaimed Michel Ardan, "it is cold enough to freeze a white bear."

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