

CHAPTER XIII.

LUNAR LANDSCAPES.

At half-past two in the morning the bullet was over the 30th lunar parallel at an effective distance of 1,000 kilometres, reduced by the optical instruments to ten. It still seemed impossible that it could reach any point on the disc. Its movement of translation, relatively slow, was inexplicable to President Barbicane. At that distance from the moon it ought to have been fast in order to maintain it against the power of attraction. The reason of that phenomenon was also inexplicable; besides, time was wanting to seek for the cause. The reliefs on the lunar surface flew beneath their eyes, and they did not want to lose a single detail.

The disc appeared through the telescopes at a distance of two and a half leagues. If an aëronaut were taken up that distance from the earth, what would he distinguish upon its surface? No one can tell, as the highest ascensions have not exceeded 8,000 metres.

The following, however, is an exact description of what Barbicane and his companions saw from that height:--

Large patches of different colours appeared on the disc. Selenographers do not agree about their nature. They are quite distinct from each

other. Julius Schmidt is of opinion that if the terrestrial oceans were dried up, a Selenite observer could only tell the difference between the terrestrial oceans and continental plains by patches of colour as distinctly varied as those which a terrestrial observer sees upon the moon. According to him, the colour common to the vast plains, known under the name of "seas," is dark grey, intermingled with green and brown. Some of the large craters are coloured in the same way.

Barbicané knew this opinion of the German selenographer; it is shared by Messrs. Boer and Moedler. He noticed that they were right, whilst certain astronomers, who only allow grey colouring on the surface of the moon, are wrong. In certain places the green colour was very vivid; according to Julius Schmidt, it is so in the Seas of Serenity and Humours. Barbicané likewise remarked the wide craters with no interior cones, which are of a bluish colour, analogous to that of fresh-polished sheets of steel. These colours really belonged to the lunar disc, and did not result, as certain astronomers think, either from some imperfection in the object-glasses of the telescopes or the interposition of the terrestrial atmosphere. Barbicané had no longer any doubt about it. He was looking at it through the void, and could not commit any optical error. He considered that the existence of this different colouring was proved to science. Now were the green shades owing to tropical vegetation, kept up by a low and dense atmosphere? He could not yet be certain.

Farther on he noticed a reddish tinge, quite sufficiently distinct. A

similar colour had already been observed upon the bottom of an isolated inclosure, known under the name of the Lichtenberg Amphitheatre, which is situated near the Hercynian Mountains, on the border of the moon. But he could not make out its nature.

He was not more fortunate about another peculiarity of the disc, for he could not find out its cause. The peculiarity was the following one:--

Michel Ardan was watching near the president when he remarked some long white lines brilliantly lighted up by the direct rays of the sun. It was a succession of luminous furrows, very different from the radiation that Copernicus had presented. They ran in parallel lines.

Michel, with his usual readiness, exclaimed--

"Why, there are cultivated fields!"

"Cultivated fields!" repeated Nicholl, shrugging his shoulders.

"Ploughed fields, at all events," replied Michel Ardan. "But what ploughmen these Selenites must be, and what gigantic oxen they must harness to their ploughs, to make such furrows!"

"They are not furrows, they are crevices!"

"Crevices let them be," answered Michel with docility. "Only what do you

mean by crevices in the world of science?" Barbicane soon told his companions all he knew about lunar crevices. He knew that they were furrows observed upon all the non-mountainous parts of the lunar disc; that these furrows, generally isolated, were from four to five leagues only; that their width varies from 1,000 to 1,500 metres, and their edges are rigorously parallel. But he knew nothing more about their formation or their nature.

Barbicane watched these furrows through his telescope very attentively. He noticed that their banks were exceedingly steep. They were long parallel ramparts; with a little imagination they might be taken for long lines of fortifications raised by Selenite engineers.

Some of these furrows were as straight as if they had been cut by line, others were slightly curved through with edges still parallel. Some crossed each other. Some crossed craters. Some furrowed the circular cavities, such as Posidonius or Petavius. Some crossed the seas, notably the Sea of Serenity.

These accidents of Nature had naturally exercised the imagination of terrestrial astronomers. The earliest observations did not discover these furrows. Neither Hevelius, Cassini, La Hire, nor Herschel seems to have known them. It was Schroeter who in 1789 first attracted the attention of savants to them. Others followed who studied them, such as Pastorff, Gruithuysen, Boer, and Moedler. At present there are seventy-six; but though they have been counted, their nature has not yet

been determined. They are not fortifications certainly, anymore than they are beds of dried-up rivers, for water so light on the surface of the moon could not have dug such ditches, and there furrows often cross craters at a great elevation.

It must, however, be acknowledged that Michel Ardan had an idea, and that, without knowing it, he shared it with Julius Schmidt.

"Why," said he, "may not these inexplicable appearances be simply phenomena of vegetation?"

"In what way do you mean?" asked Barbicane.

"Now do not be angry, worthy president," answered Michel, "but may not these black lines be regular rows of trees?"

"Do you want to find some vegetation?" said Barbicane.

"I want to explain what you scientific men do not explain! My hypothesis will at least explain why these furrows disappear, or seem to disappear, at regular epochs."

"Why should they?"

"Because trees might become invisible when they lose their leaves, and visible when they grow again."

"Your explanation is ingenious, old fellow," answered Barbicane, "but it cannot be admitted."

"Why?"

"Because it cannot be said to be any season on the surface of the moon, and, consequently, the phenomena of vegetation on the surface of the moon cannot be produced."

In fact, the slight obliquity of the lunar axis keeps the sun there at an almost equal altitude under every latitude. Above the equatorial regions the radiant orb almost invariably occupies the zenith, and hardly passes the limit of the horizon in the polar regions. Therefore, in each region, according to its position, there reigns perpetual spring, summer, autumn, or winter, as in the planet Jupiter, whose axis is also slightly inclined upon its orbit.

The origin of these furrows is a difficult question to solve. They are certainly posterior to the formation of the craters and amphitheatres, for several have crossed them, and broken their circular ramparts. It may be that they are contemporary with the latest geographical epochs, and are only owing to the expansion of natural forces.

In the meantime the projectile had reached the altitude of the 40th degree of lunar latitude at a distance that could not be greater than

800 kilometres. Objects appeared through the telescopes at two leagues only. At this point rose under their feet the Helicon, 505 metres high, and on the left were the mediocre heights, which inclose a small portion of the Sea of Rains under the name of the Gulf of Iris.

The terrestrial atmosphere ought to be 170 times more transparent than it is in order to allow astronomers to make complete observations on the surface of the moon. But in the void the projectile was moving in no fluid lay between the eye of the observer and the object observed. What is more, Barbicane was at a less distance than the most powerful telescopes, even that of Lord Rosse or the one on the Rocky Mountains, could give. It was, therefore, in circumstances highly favourable for solving the great question of the habitability of the moon. Yet the solution of this question escaped him still. He could only distinguish the deserted beds of the immense plains, and, towards the north, arid mountains. No labour betrayed the hand of man. No ruin indicated his passage. No agglomeration of animals indicated that life was developed there, even in an inferior degree. There was no movement anywhere, no appearance of vegetation anywhere. Of the three kingdoms represented on the terrestrial globe, one only was represented on that of the moon--viz., the mineral kingdom.

"So," said Michel Ardan, looking rather put out, "there is nobody after all."

"No," answered Nicholl; "we have seen neither man, animal, nor tree as

yet. After all, if the atmosphere has taken refuge at the bottom of cavities, in the interior of the amphitheatres, or even on the opposite face of the moon, we cannot decide the question."

"Besides," added Barbicane, "even for the most piercing sight a man is not visible at a distance of more than four miles. Therefore if there are any Selenites they can see our projectile, but we cannot see them."

About 11 a.m., at the altitude of the 50th parallel, the distance was reduced to 300 miles. On the left rose the capricious outlines of a chain of mountains, outlined in full light. Towards the right, on the contrary, was a large black hole like a vast dark and bottomless well bored in the lunar soil.

That hole was the Black Lake, or Pluto, a deep circle from which the earth could be conveniently studied between the last quarter and the new moon, when the shadows are thrown from west to east.

This black colour is rarely met with on the surface of the satellite. It has, as yet, only been seen in the depths of the circle of Endymion, to the east of the Cold Sea, in the northern hemisphere, and at the bottom of the circle of Grimaldi upon the equator towards the eastern border of the orb.

Pluto is a circular mountain, situated in north lat. 51° and east long. 9° . Its circle is fifty miles long and thirty wide. Barbicane regretted

not passing perpendicularly over this vast opening. There was an abyss to see, perhaps some mysterious phenomenon to become acquainted with. But the course of the projectile could not be guided. There was nothing to do but submit. A balloon could not be guided, much less a projectile when you are inside.

About 5 a.m. the northern limit of the Sea of Rains was at last passed. Mounts La Condamine and Fontenelle remained, the one on the left, the other on the right. That part of the disc, starting from the 60th degree, became absolutely mountainous. The telescopes brought it to within one league, an inferior distance to that between the summit of Mont Blanc and the sea level. All this region was bristling with peaks and amphitheatres. Mount Philolaus rose about the 70th degree to a height of 3,700 metres, opening an elliptical crater sixteen leagues long and four wide.

Then the disc, seen from that distance, presented an exceedingly strange aspect. The landscapes were very different to earthly ones, and also very inferior.

The moon having no atmosphere, this absence of vaporous covering had consequences already pointed out. There is no twilight on its surface, night following day and day following night, with the suddenness of a lamp extinguished or lighted in profound darkness. There is no transition from cold to heat: the temperature falls in one instant from boiling water heat to the cold of space.

Another consequence of this absence of air is the following:--Absolute darkness reigns where the sun's rays do not penetrate. What is called diffused light upon the earth, the luminous matter that the air holds in suspension, which creates twilights and dawns, which produces shadows, penumbrae, and all the magic of the chiaro-oscuro, does not exist upon the moon. Hence the harshness of contrasts that only admit two colours, black and white. If a Selenite shades his eyes from the solar rays the sky appears absolutely dark, and the stars shine as in the darkest nights.

The impression produced on Barbicane and his two friends by this strange state of things may well be imagined. They did not know how to use their eyes. They could no longer seize the respective distances in perspective. A lunar landscape, which does not soften the phenomenon of the chiaro-oscuro, could not be painted by a landscape-painter of the earth. It would be nothing but blots of ink upon white paper.

This aspect of things did not alter even when the projectile, then at the altitude of the 80th degree, was only separated from the moon by a distance of fifty miles, not even when, at 5 a.m., it passed at less than twenty-five miles from the mountain of Gioja, a distance which the telescopes reduced to half-a-mile. It seemed as if they could have touched the moon. It appeared impossible that before long the projectile should not knock against it, if only at the North Pole, where the brilliant mountains were clearly outlined against the dark background of

the sky. Michel Ardan wanted to open one of the port-lights and jump upon the lunar surface. What was a fall of twelve leagues? He thought nothing of that. It would, however, have been a useless attempt, for if the projectile was not going to reach any point on the satellite, Michel would have been hurled along by its movement, and not have reached it either.

At that moment, 6 a.m., the lunar pole appeared. Only half the disc, brilliantly lighted, appeared to the travellers, whilst the other half disappeared in the darkness. The projectile suddenly passed the line of demarcation between intense light and absolute darkness, and was suddenly plunged into the profoundest night.