

## CHAPTER IX.

### THE CONSEQUENCES OF DEVIATION.

Barbican had now no fear, if not about the issue of the journey, at least about the projectile's force of impulsion. Its own speed would carry it beyond the neutral line. Therefore it would not return to the earth nor remain motionless upon the point of attraction. One hypothesis only remained to be realised, the arrival of the bullet at its goal under the action of lunar attraction.

In reality it was a fall of 8,296 leagues upon a planet, it is true, where the gravity is six times less than upon the earth. Nevertheless it would be a terrible fall, and one against which all precautions ought to be taken without delay.

These precautions were of two sorts; some were for the purpose of deadening the shock at the moment the projectile would touch lunar ground; others were to retard the shock, and so make it less violent.

In order to deaden the shock, it was a pity that Barbican was no longer able to employ the means that had so usefully weakened the shock at departure--that is to say, the water used as a spring and the movable partitions. The partitions still existed, but water was wanting, for they could not use the reserve for this purpose--that would be precious

in case the liquid element should fail on the lunar soil.

Besides, this reserve would not have been sufficient for a spring. The layer of water stored in the projectile at their departure, and on which lay the waterproof disc, occupied no less than three feet in depth, and spread over a surface of not less than fifty-four feet square. Now the receptacles did not contain the fifth part of that. They were therefore obliged to give up this effectual means of deadening the shock.

Fortunately Barbicane, not content with employing water, had furnished the movable disc with strong spring buffers, destined to lessen the shock against the bottom, after breaking the horizontal partitions. These buffers were still in existence; they had only to be fitted on and the movable disc put in its place. All these pieces, easy to handle, as they weighed scarcely anything, could be rapidly mounted.

This was done. The different pieces were adjusted without difficulty. It was only a matter of bolts and screws. There were plenty of tools. The disc was soon fixed on its steel buffers like a table on its legs. One inconvenience resulted from this arrangement. The lower port-hole was covered, and it would be impossible for the travellers to observe the moon through that opening whilst they were being precipitated perpendicularly upon her. But they were obliged to give it up. Besides, through the lateral openings they could still perceive the vast lunar regions, like the earth is seen from the car of a balloon.

This placing of the disc took an hour's work. It was more than noon when the preparations were completed. Barbicane made fresh observations on the inclination of the projectile, but to his great vexation it had not turned sufficiently for a fall; it appeared to be describing a curve parallel with the lunar disc. The Queen of Night was shining splendidly in space, whilst opposite the orb of day was setting her on fire with his rays.

This situation soon became an anxious one.

"Shall we get there?" said Nicholl.

"We must act as though we should," answered Barbicane.

"You are faint-hearted fellows," replied Michel Ardan. "We shall get there, and quicker than we want."

This answer recalled Barbicane to his preparations, and he occupied himself with placing the contrivances destined to retard the fall.

It will be remembered that, at the meeting held in Tampa Town, Florida, Captain Nicholl appeared as Barbicane's enemy, and Michel Ardan's adversary. When Captain Nicholl said that the projectile would be broken like glass, Michel answered that he would retard the fall by means of fusees properly arranged.

In fact, powerful fusees, resting upon the bottom, and being fired outside, might, by producing a recoil action, lessen the speed of the bullet. These fusees were to burn in the void it is true, but oxygen would not fail them, for they would furnish that themselves like the lunar volcanoes, the deflagration of which has never been prevented by the want of atmosphere around the moon.

Barbicane had therefore provided himself with fireworks shut up in little cannons of bored steel, which could be screwed on to the bottom of the projectile. Inside these cannons were level with the bottom; outside they went half a foot beyond it. There were twenty of them. An opening in the disc allowed them to light the match with which each was provided. All the effect took place outside. The exploding mixture had been already rammed into each gun. All they had to do, therefore, was to take up the metallic buffers fixed in the base, and to put these cannons in their place, where they fitted exactly.

This fresh work was ended about 3 p.m., and all precaution taken they had now nothing to do but to wait.

In the meantime the projectile visibly drew nearer the moon. It was, therefore, submitted in some proportion to its influence; but its own velocity also inclined it in an oblique line. Perhaps the result of these two influences would be a line that would become a tangent. But it was certain that the projectile was not falling normally upon the surface of the moon, for its base, by reason of its weight, ought to

have been turned towards her.

Barbican's anxiety was increased on seeing that his bullet resisted the influence of gravitation. It was the unknown that was before him--the unknown of the interstellar regions. He, the savant, believed that he had foreseen the only three hypotheses that were possible--the return to the earth, the fall upon the moon, or stagnation upon the neutral line! And here a fourth hypothesis, full of all the terrors of the infinite, cropped up inopportunately. To face it without flinching took a resolute savant like Barbicane, a phlegmatic being like Nicholl, or an audacious adventurer like Michel Ardan.

Conversation was started on this subject. Other men would have considered the question from a practical point of view. They would have wondered where the projectile would take them to. Not they, however. They sought the cause that had produced this effect.

"So we are off the line," said Michel. "But how is that?"

"I am very much afraid," answered Nicholl, "that notwithstanding all the precautions that were taken, the Columbiad was not aimed correctly. The slightest error would suffice to throw us outside the pale of lunar attraction."

"Then the cannon was pointed badly?" said Michel.

"I do not think so," answered Barbicane. "The cannon was rigorously perpendicular, and its direction towards the zenith of the place was incontestable. The moon passing the zenith, we ought to have reached her at the full. There is another reason, but it escapes me."

"Perhaps we have arrived too late," suggested Nicholl.

"Too late?" said Barbicane.

"Yes," resumed Nicholl. "The notice from the Cambridge Observatory said that the transit ought to be accomplished in ninety-seven hours thirteen minutes and twenty seconds. That means that before that time the moon would not have reached the point indicated, and after she would have passed it."

"Agreed," answered Barbicane. "But we started on the 1st of December at 11h. 13m. 25s. p.m., and we ought to arrive at midnight on the 5th, precisely as the moon is full. Now this is the 5th of December. It is half-past three, and eight hours and a half ought to be sufficient to take us to our goal. Why are we not going towards it?"

"Perhaps the velocity was greater than it ought to have been," answered Nicholl, "for we know now that the initial velocity was greater than it was supposed to be."

"No! a hundred times no!" replied Barbicane. "An excess of velocity,

supposing the direction of the projectile to have been correct, would not have prevented us reaching the moon. No! There has been a deviation. We have deviated!"

"Through whom? through what?" asked Nicholl.

"I cannot tell," answered Barbicane.

"Well, Barbicane," then said Michel, "should you like to know what I think about why we have deviated?"

"Say what you think."

"I would not give half a dollar to know! We have deviated, that is a fact. It does not matter much where we are going. We shall soon find out. As we are being carried along into space we shall end by falling into some centre of attraction or another."

Barbicane could not be contented with this indifference of Michel Ardan's. Not that he was anxious about the future. But what he wanted to know, at any price, was why his projectile had deviated.

In the meantime the projectile kept on its course sideways to the moon, and the objects thrown out along with it. Barbicane could even prove by the landmarks upon the moon, which was only at 2,000 leagues' distance, that its speed was becoming uniform--a fresh proof that they were not

falling. Its force of impulsion was prevailing over the lunar attraction, but the trajectory of the projectile was certainly taking them nearer the lunar disc, and it might be hoped that at a nearer point the weight would predominate and provoke a fall.

The three friends, having nothing better to do, went on with their observations. They could not, however, yet determine the topography of the satellite. Every relief was levelled under the action of the solar rays.

They watched thus through the lateral windows until 8 p.m. The moon then looked so large that she hid half the firmament from them. The sun on one side, and the Queen of Night on the other, inundated the projectile with light.

At that moment Barbicane thought he could estimate at 700 leagues only the distance that separated them from their goal. The velocity of the projectile appeared to him to be 200 yards a second, or about 170 leagues an hour. The base of the bullet had a tendency to turn towards the moon under the influence of the centripetal force; but the centrifugal force still predominated, and it became probable that the rectilinear trajectory would change to some curve the nature of which could not be determined.

Barbicane still sought the solution of his insoluble problem. The hours went by without result. The projectile visibly drew nearer to the moon,



but it was plain that it would not reach her. The short distance at which it would pass her would be the result of two forces, attractive and repulsive, which acted upon the projectile.

"I only pray for one thing," repeated Michel, "and that is to pass near enough to the moon to penetrate her secrets."

"Confound the cause that made our projectile deviate!" cried Nicholl.

"Then," said Barbicane, as if he had been suddenly struck with an idea, "confound that asteroid that crossed our path!"

"Eh?" said Michel Ardan.

"What do you mean?" exclaimed Nicholl.

"I mean," resumed Barbicane, who appeared convinced, "I mean that our deviation is solely due to the influence of that wandering body."

"But it did not even graze us," continued Michel.

"What does that matter? Its bulk, compared with that of our projectile, was enormous, and its attraction was sufficient to have an influence upon our direction."

"That influence must have been very slight," said Nicholl.

"Yes, Nicholl, but slight as it was," answered Barbicane, "upon a distance of 84,000 leagues it was enough to make us miss the moon!"