

CHAPTER XXIII.

THE PROJECTILE COMPARTMENT.

After the celebrated Columbiad was completed public interest immediately centred upon the projectile, the new vehicle destined to transport the three bold adventurers across space. No one had forgotten that in his despatch of September 30th Michel Ardan asked for a modification of the plans laid out by the members of the committee.

President Barbicane then thought with reason that the form of the projectile was of slight importance, for, after crossing the atmosphere in a few seconds, it would meet with vacuum. The committee had therefore chosen the round form, so that the ball might turn over and over and do as it liked. But as soon as it had to be made into a vehicle, that was another thing. Michel Ardan did not want to travel squirrel-fashion; he wished to go up head up and feet down with as much dignity as in the car of a balloon, quicker of course, but without unseemly gambols.

New plans were, therefore, sent to the firm of Breadwill and Co., of Albany, with the recommendation to execute them without delay. The projectile, thus modified, was cast on the 2nd of November, and sent immediately to Stony Hill by the Eastern Railway.

On the 10th it arrived without accident at its place of destination.

Michel Ardan, Barbicane, and Nicholl awaited with the most lively impatience this "projectile compartment" in which they were to take their passage for the discovery of a new world.

It must be acknowledged that it was a magnificent piece of metal, a metallurgic production that did the greatest honour to the industrial genius of the Americans. It was the first time that aluminium had been obtained in so large a mass, which result might be justly regarded as prodigious. This precious projectile sparkled in the rays of the sun. Seeing it in its imposing shape with its conical top, it might easily have been taken for one of those extinguisher-shaped towers that architects of the Middle Ages put at the angles of their castles. It only wanted loopholes and a weathercock.

"I expect," exclaimed Michel Ardan, "to see a man armed cap-à-pie come out of it. We shall be like feudal lords in there; with a little artillery we could hold our own against a whole army of Selenites--that is, if there are any in the moon!"

"Then the vehicle pleases you?" asked Barbicane.

"Yes, yes! certainly," answered Michel Ardan, who was examining it as an artist. "I only regret that its form is not a little more slender, its cone more graceful; it ought to be terminated by a metal group, some Gothic ornament, a salamander escaping from it with outspread wings and open beak."

"What would be the use?" said Barbicane, whose positive mind was little sensitive to the beauties of art.

"Ah, friend Barbicane, I am afraid you will never understand the use, or you would not ask!"

"Well, tell me, at all events, my brave companion."

"Well, my friend, I think we ought always to put a little art in all we do. Do you know an Indian play called The Child's Chariot?"

"Not even by name," answered Barbicane.

"I am not surprised at that," continued Michel Ardan. "Learn, then, that in that play there is a robber who, when in the act of piercing the wall of a house, stops to consider whether he shall make his hole in the shape of a lyre, a flower, or a bird. Well, tell me, friend Barbicane, if at that epoch you had been his judge would you have condemned that robber?"

"Without hesitation," answered the president of the Gun Club, "and as a burglar too."

"Well, I should have acquitted him, friend Barbicane. That is why you could never understand me."

"I will not even try, my valiant artist."

"But, at least," continued Michel Ardan, "as the exterior of our projectile compartment leaves much to be desired, I shall be allowed to furnish the inside as I choose, and with all luxury suitable to ambassadors from the earth."

"About that, my brave Michel," answered Barbicane, "you can do entirely as you please."

But before passing to the agreeable the president of the Gun Club had thought of the useful, and the means he had invented for lessening the effects of the shock were applied with perfect intelligence.

Barbicane had said to himself, not unreasonably, that no spring would be sufficiently powerful to deaden the shock, and during his famous promenade in Skersnaw Wood he had ended by solving this great difficulty in an ingenious fashion. He depended upon water to render him this signal service. This is how:--

The projectile was to be filled to the depth of three feet with water destined to support a water-tight wooden disc, which easily worked within the walls of the projectile. It was upon this raft that the travellers were to take their place. As to the liquid mass, it was divided by horizontal partitions which the departing shock would

successively break; then each sheet of water, from the lowest to the highest, escaping by valves in the upper part of the projectile, thus making a spring, and the disc, itself furnished with extremely powerful buffers, could not strike the bottom until it had successively broken the different partitions. The travellers would doubtless feel a violent recoil after the complete escape of the liquid mass, but the first shock would be almost entirely deadened by so powerful a spring.

It is true that three feet on a surface of 541 square feet would weigh nearly 11,500 lbs; but the escape of gas accumulated in the Columbiad would suffice, Barbicane thought to conquer that increase of weight; besides, the shock would send out all that water in less than a second, and the projectile would soon regain its normal weight.

This is what the president of the Gun Club had imagined, and how he thought he had solved the great question of the recoil. This work, intelligently comprehended by the engineers of the Breadwill firm, was marvellously executed; the effect once produced and the water gone, the travellers could easily get rid of the broken partitions and take away the mobile disc that bore them at the moment of departure.

As to the upper sides of the projectile, they were lined with a thick wadding of leather, put upon the best steel springs as supple as watch-springs. The escape-pipes hidden under this wadding were not even seen.

All imaginable precautions for deadening the first shock having been taken, Michel Ardan said they must be made of "very bad stuff" to be crushed.

The projectile outside was nine feet wide and twelve feet high. In order not to pass the weight assigned the sides had been made a little less thick and the bottom thicker, as it would have to support all the violence of the gases developed by the deflagration of the pyroxyle. Bombs and cylindro-conical howitzers are always made with thicker bottoms.

The entrance to this tower of metal was a narrow opening in the wall of the cone, like the "man-hole" of steam boilers. It closed hermetically by means of an aluminium plate fastened inside by powerful screw pressure. The travellers could therefore leave their mobile prison at will as soon as they had reached the Queen of Night.

But going was not everything; it was necessary to see on the road. Nothing was easier. In fact, under the wadding were four thick lenticular footlights, two let into the circular wall of the projectile, the third in its lower part, and the fourth in its cone. The travellers could, therefore, observe during their journey the earth they were leaving, the moon they were approaching, and the constellated spaces of the sky. These skylights were protected against the shocks of departure by plates let into solid grooves, which it was easy to move by unscrewing them. By that means the air contained in the projectile could

not escape, and it was possible to make observations.

All these mechanical appliances, admirably set, worked with the greatest ease, and the engineers had not shown themselves less intelligent in the arrangement of the projectile compartment.

Lockers solidly fastened were destined to contain the water and provisions necessary for the three travellers; they could even procure themselves fire and light by means of gas stored up in a special case under a pressure of several atmospheres. All they had to do was to turn a tap, and the gas would light and warm this comfortable vehicle for six days. It will be seen that none of the things essential to life, or even to comfort, were wanting. More, thanks to the instincts of Michel Ardan, the agreeable was joined to the useful under the form of objects of art; he would have made a veritable artist's studio of his projectile if room had not been wanting. It would be mistaken to suppose that three persons would be restricted for space in that metal tower. It had a surface of 54 square feet, and was nearly 10 feet high, and allowed its occupiers a certain liberty of movement. They would not have been so much at their ease in the most comfortable railway compartment of the United States.

The question of provisions and lighting having been solved, there remained the question of air. It was evident that the air confined in the projectile would not be sufficient for the travellers' respiration for four days; each man, in fact, consumes in one hour all the oxygen contained in 100 litres of air. Barbicane, his two companions, and two

dogs that he meant to take, would consume every twenty-four hours 2,400 litres of oxygen, or a weight equal to 7 lbs. The air in the projectile must, therefore, be renewed. How? By a very simple method, that of Messrs. Reiset and Regnault, indicated by Michel Ardan during the discussion of the meeting.

It is known that the air is composed principally of twenty-one parts of oxygen and seventy-nine parts of azote. Now what happens in the act of respiration? A very simple phenomenon, Man absorbs the oxygen of the air, eminently adapted for sustaining life, and throws out the azote intact. The air breathed out has lost nearly five per cent, of its oxygen, and then contains a nearly equal volume of carbonic acid, the definitive product of the combustion of the elements of the blood by the oxygen breathed in it. It happens, therefore, that in a confined space and after a certain time all the oxygen of the air is replaced by carbonic acid, an essentially deleterious gas.

The question was then reduced to this, the azote being conserved intact--1. To remake the oxygen absorbed; 2. To destroy the carbonic acid breathed out. Nothing easier to do by means of chlorate of potash and caustic potash. The former is a salt which appears under the form of white crystals; when heated to a temperature of 400° it is transformed into chlorine of potassium, and the oxygen which it contains is given off freely. Now 18 lbs. of chlorate of potash give 7 lbs of oxygen--that is to say, the quantity necessary to the travellers for twenty-four hours.

As to caustic potash, it has a great affinity for carbonic acid mixed in air, and it is sufficient to shake it in order for it to seize upon the acid and form bicarbonate of potash. So much for the absorption of carbonic acid.

By combining these two methods they were certain of giving back to vitiated air all its life-giving qualities. The two chemists, Messrs. Reiset and Regnault, had made the experiment with success.

But it must be said the experiment had only been made in *anima vili*. Whatever its scientific accuracy might be, no one knew how man could bear it.

Such was the observation made at the meeting where this grave question was discussed. Michel Ardan meant to leave no doubt about the possibility of living by means of this artificial air, and he offered to make the trial before the departure.

But the honour of putting it to the proof was energetically claimed by J.T. Maston.

"As I am not going with you," said the brave artilleryman, "the least I can do will be to live in the projectile for a week."

It would have been ungracious to refuse him. His wish was complied with.

A sufficient quantity of chlorate of potash and caustic potash was placed at his disposition, with provisions for a week; then having shaken hands with his friends, on the 12th of November at 6 a.m., after having expressly recommended them not to open his prison before the 20th at 6 p.m., he crept into the projectile, the iron plate of which was hermetically shut.

What happened during that week? It was impossible to ascertain. The thickness of the projectile's walls prevented any interior noise from reaching the outside.

On the 20th of November, at six o'clock precisely, the plate was removed; the friends of J.T. Maston were rather uneasy. But they were promptly reassured by hearing a joyful voice shouting a formidable hurrah!

The secretary of the Gun Club appeared on the summit of the cone in a triumphant attitude.

He had grown fat!