

## CHAPTER VI.

WHAT IT IS IMPOSSIBLE TO IGNORE AND WHAT IS NO LONGER ALLOWED TO BE BELIEVED IN THE UNITED STATES.

The immediate effect of Barbicane's proposition was that of bringing out all astronomical facts relative to the Queen of Night. Everybody began to study her assiduously. It seemed as if the moon had appeared on the horizon for the first time, and that no one had ever seen her in the sky before. She became the fashion; she was the lion of the day, without appearing less modest on that account, and took her place amongst the "stars" without being any the prouder. The newspapers revived old anecdotes in which this "Sun of the wolves" played a part; they recalled the influence which the ignorance of past ages had ascribed to her; they sang about her in every tone; a little more and they would have quoted her witty sayings; the whole of America was filled with selenomania.

The scientific journals treated the question which touched upon the enterprise of the Gun Club more specially; they published the letter from the Observatory of Cambridge, they commented upon it and approved of it without reserve.

In short, even the most ignorant Yankee was no longer allowed to be ignorant of a single fact relative to his satellite, nor, to the oldest

women amongst them, to have any superstitions about her left. Science flooded them; it penetrated into their eyes and ears; it was impossible to be an ass--in astronomy.

Until then many people did not know how the distance between the earth and the moon had been calculated. This fact was taken advantage of to explain to them that it was done by measuring the parallax of the moon. If the word "parallax" seemed new to them, they were told it was the angle formed by two straight lines drawn from either extremity of the earth's radius to the moon. If they were in doubt about the perfection of this method, it was immediately proved to them that not only was the mean distance 234,347 miles, but that astronomers were right to within seventy miles.

To those who were not familiar with the movements of the moon, the newspapers demonstrated daily that she possesses two distinct movements, the first being that of rotation upon her axis, the second that of revolution round the earth, accomplishing both in the same time--that is to say, in  $27\frac{1}{3}$  days.

The movement of rotation is the one that causes night and day on the surface of the moon, only there is but one day and one night in a lunar month, and they each last  $354\frac{1}{3}$  hours. But, happily, the face, turned towards the terrestrial globe, is lighted by it with an intensity equal to the light of fourteen moons. As to the other face, the one always invisible, it has naturally 354 hours of absolute night, tempered only

by "the pale light that falls from the stars." This phenomenon is due solely to the peculiarity that the movements of rotation and revolution are accomplished in rigorously equal periods, a phenomenon which, according to Cassini and Herschel, is common to the satellites of Jupiter, and, very probably to the other satellites.

Some well-disposed but rather unyielding minds did not quite understand at first how, if the moon invariably shows the same face to the earth during her revolution, she describes one turn round herself in the same period of time. To such it was answered--"Go into your dining-room, and turn round the table so as always to keep your face towards the centre; when your circular walk is ended you will have described one circle round yourselves, since your eye will have successively traversed every point of the room. Well, then, the room is the heavens, the table is the earth, and you are the moon!"

And they go away delighted with the comparison.

Thus, then, the moon always presents the same face to the earth; still, to be quite exact, it should be added that in consequence of certain fluctuations from north to south and from west to east, called libration, she shows rather more than the half of her disc, about 0.57.

When the ignoramuses knew as much as the director of the Cambridge Observatory about the moon's movement of rotation they began to make themselves uneasy about her movement of revolution round the earth, and

twenty scientific reviews quickly gave them the information they wanted. They then learnt that the firmament, with its infinite stars, may be looked upon as a vast dial upon which the moon moves, indicating the time to all the inhabitants of the earth; that it is in this movement that the Queen of Night shows herself in her different phases, that she is full when she is in opposition with the sun--that is to say, when the three bodies are on a line with each other, the earth being in the centre; that the moon is new when she is in conjunction with the sun--that is to say, when she is between the sun and the earth; lastly, that the moon is in her first or last quarter when she makes, with the sun and the earth, a right angle of which she occupies the apex.

Some perspicacious Yankees inferred in consequence that eclipses could only take place at the periods of conjunction or opposition, and their reasoning was just. In conjunction the moon can eclipse the sun, whilst in opposition it is the earth that can eclipse him in her turn; and the reason these eclipses do not happen twice in a lunar month is because the plane upon which the moon moves is elliptical like that of the earth.

As to the height which the Queen of Night can attain above the horizon, the letter from the Observatory of Cambridge contained all that can be said about it. Every one knew that this height varies according to the latitude of the place where the observation is taken. But the only zones of the globe where the moon reaches her zenith--that is to say, where she is directly above the heads of the spectators--are necessarily

comprised between the 28th parallels and the equator. Hence the important recommendation given to attempt the experiment upon some point in this part of the globe, in order that the projectile may be hurled perpendicularly, and may thus more quickly escape the attraction of gravitation. This was a condition essential to the success of the enterprise, and public opinion was much exercised thereupon.

As to the line followed by the moon in her revolution round the earth, the Observatory of Cambridge had demonstrated to the most ignorant that it is an ellipse of which the earth occupies one of the foci. These elliptical orbits are common to all the planets as well as to all the satellites, and rational mechanism rigorously proves that it could not be otherwise. It was clearly understood that when at her apogee the moon was farthest from the earth, and when at her perigee she was nearest to our planet.

This, therefore, was what every American knew whether he wished to or no, and what no one could decently be ignorant of. But if these true principles rapidly made their way, certain illusive fears and many errors were with difficulty cleared away.

Some worthy people maintained, for instance, that the moon was an ancient comet, which, whilst travelling along its elongated orbit round the sun, passed near to the earth, and was retained in her circle of attraction. The drawing-room astronomers pretended to explain thus the burnt aspect of the moon, a misfortune of which they accused the sun.

Only when they were told to notice that comets have an atmosphere, and that the moon has little or none, they did not know what to answer.

Others belonging to the class of "Shakers" manifested certain fears about the moon; they had heard that since the observations made in the times of the Caliphs her movement of revolution had accelerated in a certain proportion; they thence very logically concluded that an acceleration of movement must correspond to a diminution in the distance between the two bodies, and that this double effect going on infinitely the moon would one day end by falling into the earth. However, they were obliged to reassure themselves and cease to fear for future generations when they were told that according to the calculations of Laplace, an illustrious French mathematician, this acceleration of movement was restricted within very narrow limits, and that a proportional diminution will follow it. Thus the equilibrium of the solar world cannot be disturbed in future centuries.

Lastly there was the superstitious class of ignoramuses to be dealt with; these are not content with being ignorant; they know what does not exist, and about the moon they know a great deal. Some of them considered her disc to be a polished mirror by means of which people might see themselves from different points on the earth, and communicate their thoughts to one another. Others pretended that out of 1,000 new moons 950 had brought some notable change, such as cataclysms, revolutions, earthquakes, deluges, &c.; they therefore believed in the mysterious influence of the Queen of Night on human destinies; they

think that every Selenite is connected by some sympathetic tie with each inhabitant of the earth; they pretend, with Dr. Mead, that she entirely governs the vital system--that boys are born during the new moon and girls during her last quarter, &c., &c. But at last it became necessary to give up these vulgar errors, to come back to truth; and if the moon, stripped of her influence, lost her prestige in the minds of courtesans of every power, if some turned their backs on her, the immense majority were in her favour. As to the Yankees, they had no other ambition than that of taking possession of this new continent of the sky, and to plant upon its highest summit the star-spangled banner of the United States of America.