



Evangelista Torricelli

1608-1647

Torricelli, one of the most important mathematicians and physicists of the 17th Century, was greatly influenced by Galileo Galilei.

The most celebrated discovery by Torricelli in Physics was the pressure of the atmosphere and the mercury barometer to measure it. He asked Viviani (a scientist and a specialist in glass tube production) to make a tube about one metre long, open at one end, to fill it with mercury and to turn it into a bowl full of mercury. The height of the mercury column inside the tube gives a measure of the atmospheric pressure, because such a column compensates the weight of the air at the exterior. **He related correctly the height of the column to the specific weight of the material.** He anticipated that in the case of water the corresponding column would be about 10 m in height, a result that was later verified by Pascal.

Torricelli, the eldest of three children, was born on October 15th, 1608, in Faenza, a small city in the north-east of Italy. The city belonged to the Romagna Region, that was, at the time, under the direct rule of the Popes. His father, Alessandro, a modest textile artisan, realised the potential qualities of his son, and, by the intervention of his uncle, the Camaldolese monk Jacopo, was able to give him a basic humanistic education, so that he could attend the mathematics and philosophy courses of the Jesuit School in Faenza. There, he showed such outstanding abilities that he was sent to Rome to the school of the Jesuit Benedetto Castelli, a former pupil of Galileo, who engaged him as his secretary and considered him an accomplished scientist.

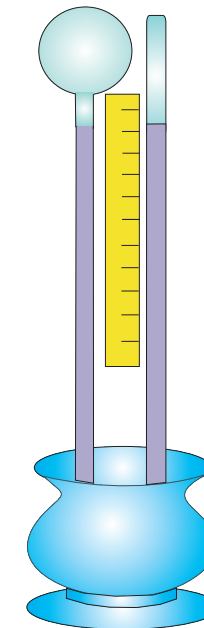
The first document concerning his scientific studies is his correspondence with Galileo, in which he declares his full acceptance of the Copernican doctrine.

After a period of ten years as a secretary to Monsignor Giovanni Ciampoli, who was the governor of various cities in the Papal states, Torricelli was back in Rome and wrote a paper on the dynamics of material objects, which attracted the attention of Father Castelli and of Galileo, who invited him to Arcetri.



He obtained a vacuum

(From Diorama in the Science Museum, London)



Torricelli invented the mercury barometer



Torricelli spent the last months of 1642 in Arcetri, in close friendship with Galileo. After the death of Galileo he was appointed his successor to the position of mathematician and philosopher to Duke Ferdinando II of Tuscany, with a good salary and lodgings in the Medici Palace.

Torricelli remained in this position until the end of his life, on 25th October 1647, producing works of great scientific importance. The only one published during his lifetime was ***Opera geometrica*** which made him well known in all Europe as a fine geometer.

Many of his discoveries in mathematics and physics were made known through an intense correspondence with the Italian and French scholars Cavalieri, Fermat and Roberval (well known are the polemics with Roberval over the priority of discovery of some properties of the cycloid: one is that the area between the cycloid and its base is three times the area of the generating circle).

Very important also were his studies of hydrodynamics, with the proof of the theorem which bears his name: ***the velocity of the water jet from a hole in a full container is the same as a drop of liquid would have if it fell freely from the surface of the liquid to the orifice of efflux.***

The experimental ability of Torricelli was also considerable, and it is documented in his ability to produce optical lenses and telescopes of the highest quality, some of which are still preserved at the History of Science Museum in Florence and the lenses have been shown to be comparable in quality to those made in modern times.

I.P.S.