



Torricelli's barometer

Italian physicist Evangelista Torricelli challenged two prevailing Aristotelian ideas in 1644—that air could not exert weight on Earth and that nature abhors a vacuum—with a novel experiment. In contrast to those conceptions, held by Torricelli's mentor Galileo Galilei among others, the experiment proved that air has mass and that a stable vacuum can occur naturally. This 17th-century illustration by Gaspar Schott, a German Jesuit mathematician and science writer, combines aspects of Torricelli's original apparatus with later variations built by contemporary scientists. It accompanies Schott's commentary on advances in vacuum science in his 1664 Latin text *Technica Curiosa*, a copy of which is held at the Niels Bohr Library and Archives of the American Institute of Physics (publisher of *PHYSICS TODAY*).

Glass tubes of various shapes and sizes, each sealed at one end, are filled with mercury and their open ends submerged in a mercury-filled vat. The mercury in the tubes begins to flow into the vat, creating a vacuum at the top of each tube. At approximately 760 mm above the vat's surface, however, the mercury stops flowing, no matter a tube's shape, length, or angle relative to the horizontal. That phenomenon, Torricelli realized, was caused by the weight of the air pressing on the mercury in the vat to balance the weight of the mercury in the tube, and it allowed him to measure atmospheric pressure. Torricelli is credited with inventing the barometer, whose traditional unit is defined as 1 atm = 760 mm Hg, the height of the suspended mercury that Torricelli observed in his experiment. The torr (1/760 atm) is named in his honor.

—KC

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