

Scientific Method

Is it THE Scientific Method?

Or, are there several
Scientific Methods?

Aristotle's Research Theory (Tr)

- In the Middle Ages philosophically inclined theologians re-discovered Aristotle's complete works, in part due to Arabic-Islamic scholars who had tr. the Greek text
- Theory of a "Full Universe"
- "Nature abhors a vacuum" (i.e. There is no possibility of a vacuum existing in Nature)
- Therefore, there must be an opening to let in air, otherwise an impossibility would result, a vacuum (which cannot exist, by definition)!

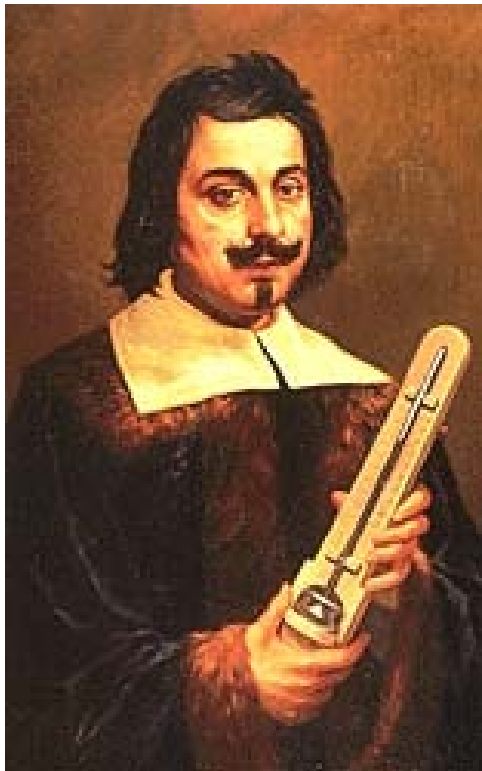
Galileo's 1638 Dialogues

- In 1638 Galileo wrote his Dialogues concerning Two New Sciences
- A suction pump cannot raise water more than 34 feet and Galileo explored this fact
- Mining involves using several pumps
- Torricelli was a student of Galileo's

Torricelli's Hunch ("Abduction")

- A deduction from Galileo's working Hr (Tr)
- Later, combined with insights concerning pressure under water, deep in the ocean
- 1640 in Florence (?)
- Liquid mercury ("quicksilver") is 14 times as heavy as water
- 34 feet divided by 14 = $2 \frac{3}{7}^{\text{th}}$ feet
- Three foot long tube (a true vacuum)

Evangelista Torricelli



Blaise Pascal's Torricellian Experiments: 1647-48

- As you go up higher the height of a column will be decreased
- At sea level the 34 foot rule is accurate
- Air pressure is measured by a baro-meter
- Perier Pascal took a column of water to various mountain tops (e.g. Puy-de-Dome)
- Repetition of the “experiment” gave the same results at different locations on top of the mountain (even with clouds, etc.)

Blaise Pascal

