



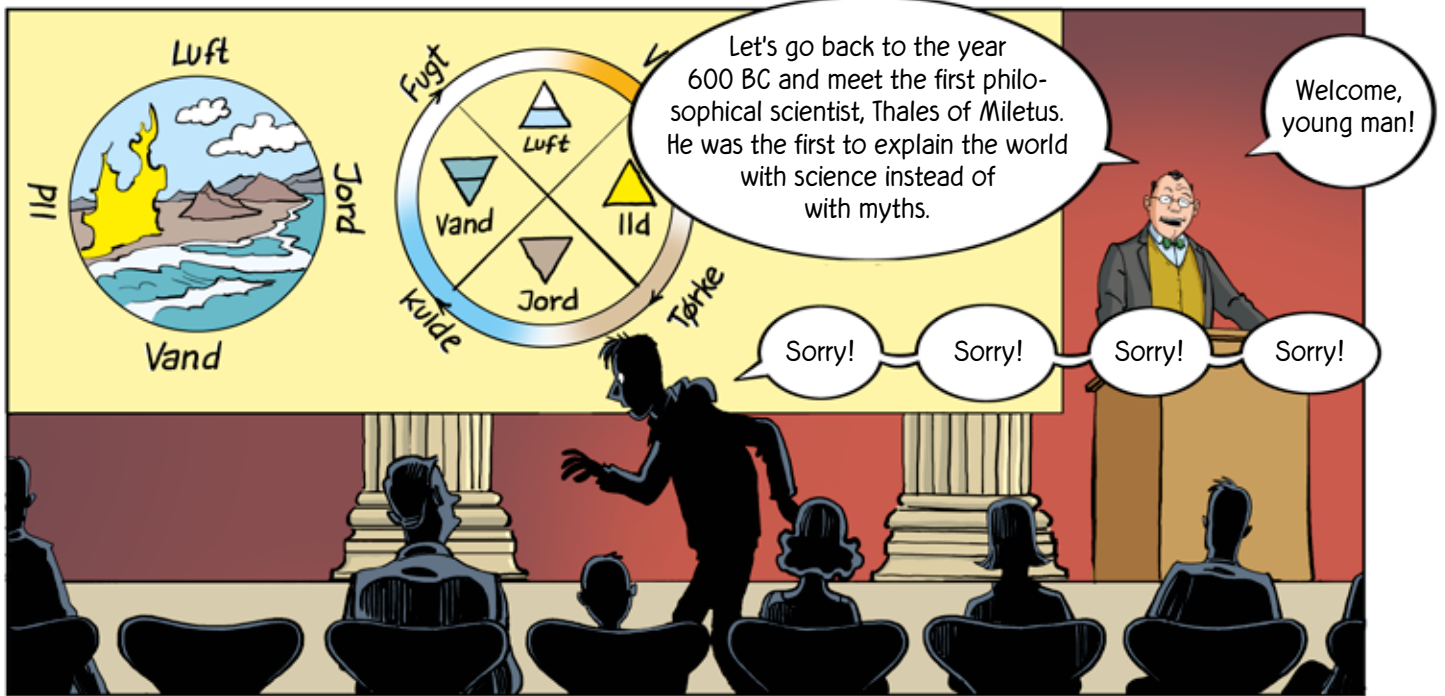
**LECTURE**  
 MONDAY 8 PM  
**The Ancient  
 Greeks and  
 Modern  
 Physics**  
 Prof. Pedersen  
 FREE  
 ENTRANCE

'Dear Thomas,  
 Meet me at The Glyptotek  
 tonight at 8 PM. Take the  
 empty seat at the front  
 row and wait. You will not  
 regret it.  
 Regards  
 Your friend T'

No need to panic. They've just started.

Okay boomer!

Tonight I will show you how modern physics is based on ideas that arose in ancient Greece ...



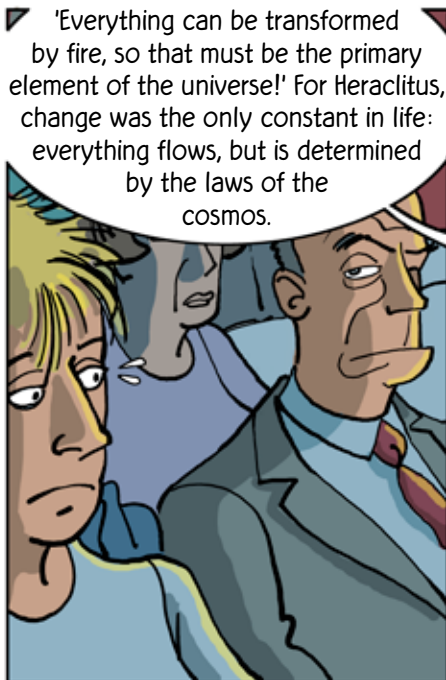
Thales philosophized about the substance of matter and concluded that water must be the primordial substance of the world...



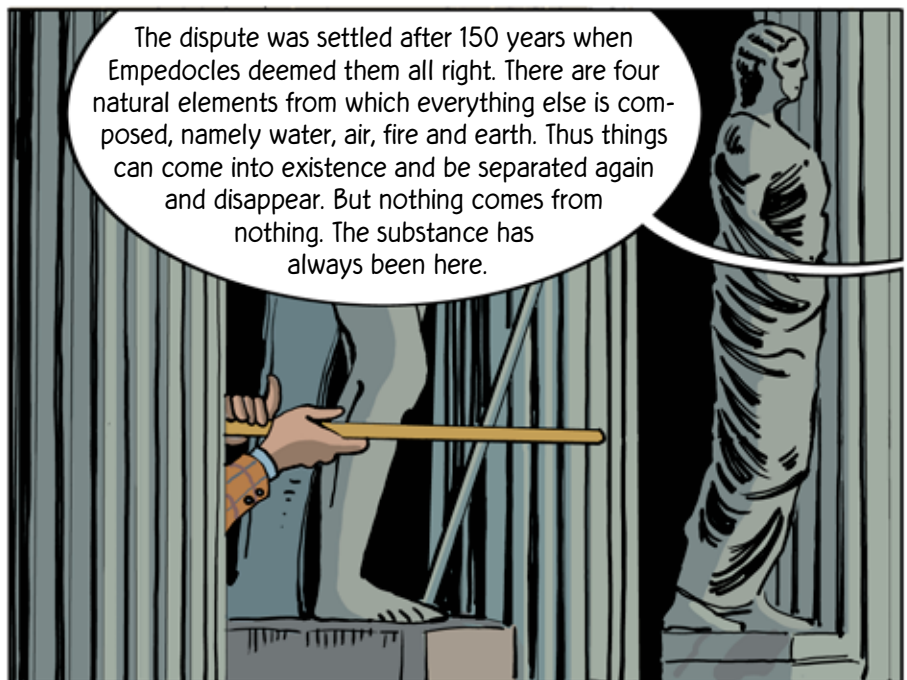
'Reserved' - but by whom? A greeting from my mysterious 'friend'? Is he sitting in this hall and watching me right now?



... and that everything is made of water in one form or another. But then came Anaximenes: He believed that everything was composed of air. 'No!' Heraclitus said...



'Everything can be transformed by fire, so that must be the primary element of the universe!' For Heraclitus, change was the only constant in life: everything flows, but is determined by the laws of the cosmos.



The dispute was settled after 150 years when Empedocles deemed them all right. There are four natural elements from which everything else is composed, namely water, air, fire and earth. Thus things can come into existence and be separated again and disappear. But nothing comes from nothing. The substance has always been here.



As the primordial substances were now in place, at 400 years BC Democritus could develop the atomic theory. Everything can be split into still smaller bits, right down to the indivisible atoms.

Demokrit

Atom

Jern

Vand

ATOMER!

Our world is an infinite amount of atoms controlled by eternal laws. The atoms cannot be obliterated and things arise when they gather.

omg!

It took a long time before the atomic theory became accepted, and today we know that atoms can be split and consist of even smaller parts such as protons and neutrons. And they again consist of even smaller parts, called quarks.

Neutron  
Elektron  
Proton

kvark

Neutron Proton

But the innermost nature of matter is still as hidden to us as it was to the ancient Greeks.

KLAP! KLAP! KLAP! KLAP! KLAP!

PFFFT!

Zzzzzz...

PLINK!

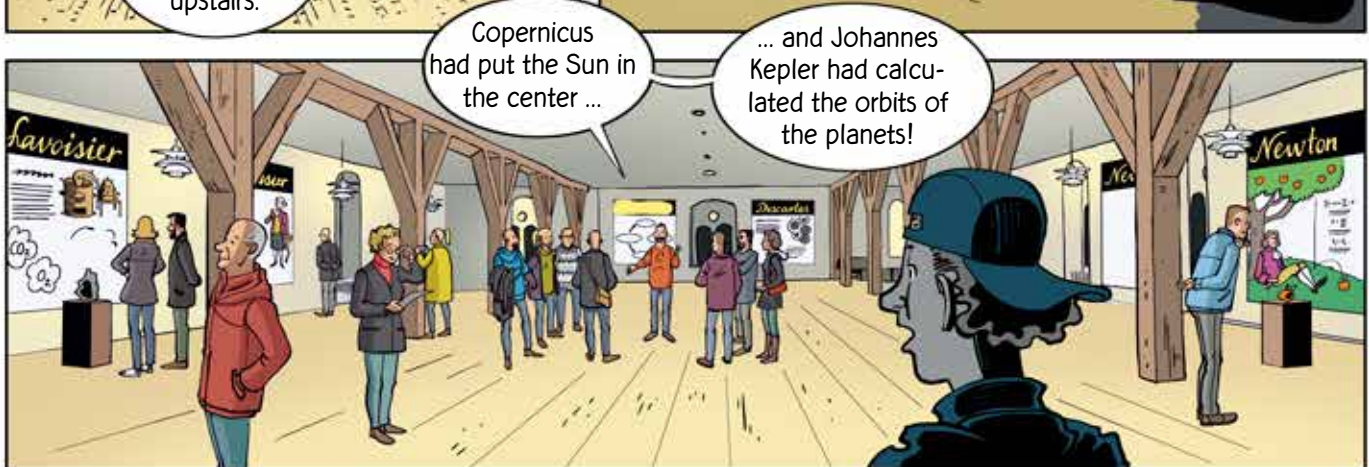
WHO did that?

HEY!





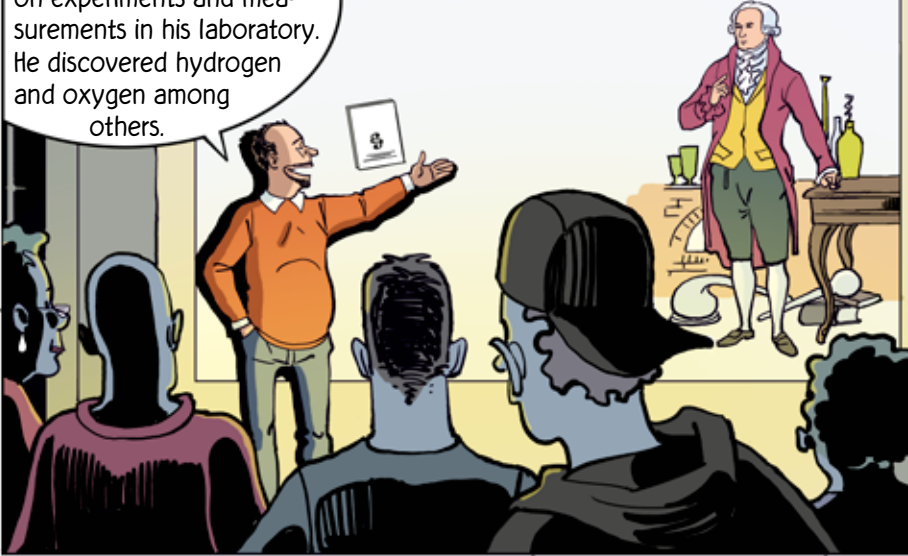
The Round Tower,  
Copenhagen.  
Wednesday 8 P.M.





Modern chemistry replaced alchemy. Antoine Lavoisier based his theories on experiments and measurements in his laboratory. He discovered hydrogen and oxygen among others.

# Lavoisier



In 1789 he published the textbook 'Elementary Treatise on Chemistry'. He defined an element as a substance that cannot be broken down into other substances, drew up the first list of the known elements and predicted the existence of silicon. He was guillotined on 8 May 1794.



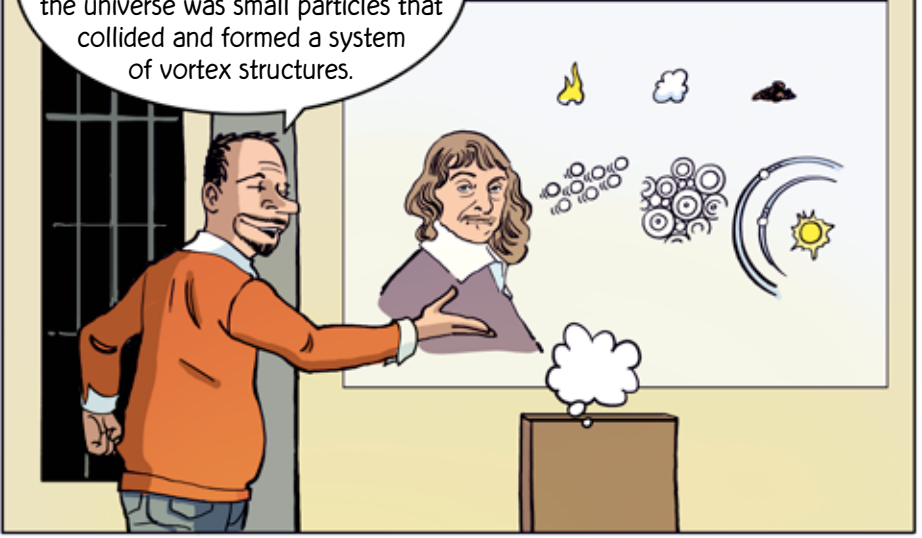
That's all very fine, but before we go into further details, I just want to hear, WHICH of you guys sent me this anonymous letter...



Patience, young man! Let's save the questions for later!

Also on the field of physics new thoughts emerged. René Descartes developed a unitary theory in which all matter in the universe was small particles that collided and formed a system of vortex structures.

# Descartes

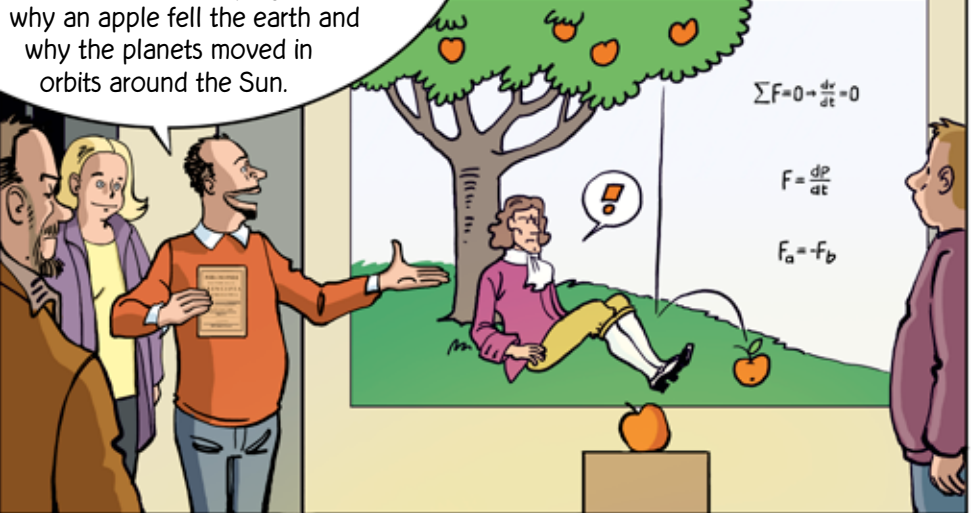


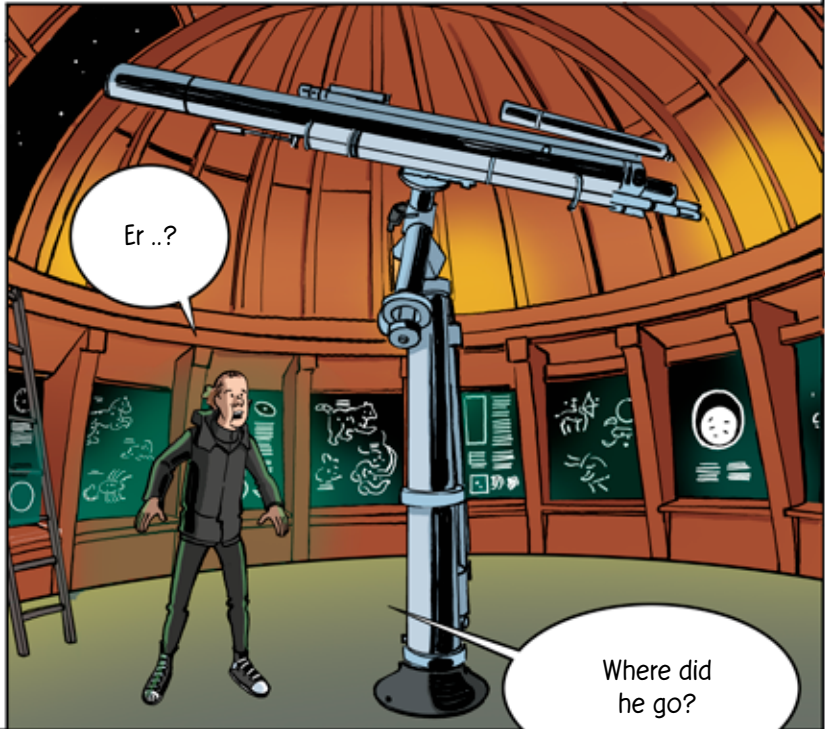
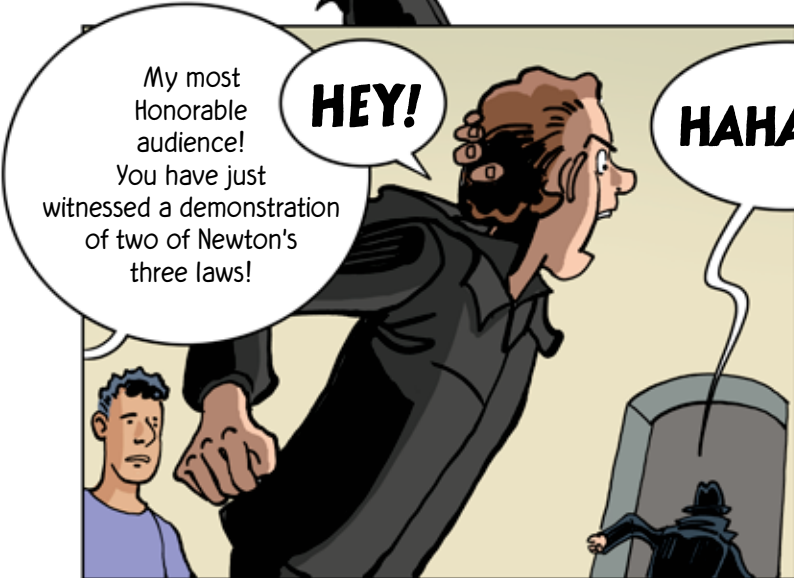
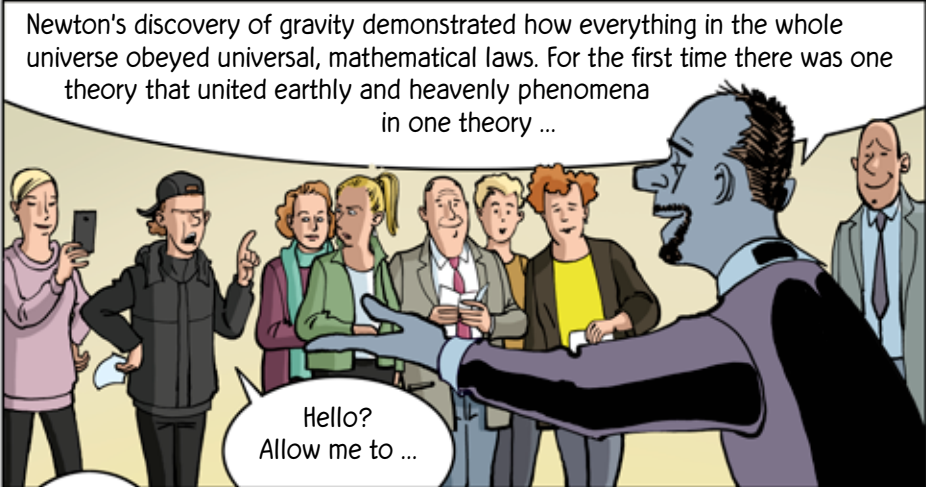
Even the planets moved in circling bands of vortices, he thought. For a long time, his theory was the most widely accepted explanation of the Sun's and the planets' movements.



But in 1787 the Englishman Isaac Newton published 'The Mathematical Principles of Natural Philosophy', where he presented his gravitation theory, which simultaneously figured out why an apple fell the earth and why the planets moved in orbits around the Sun.

# Newton





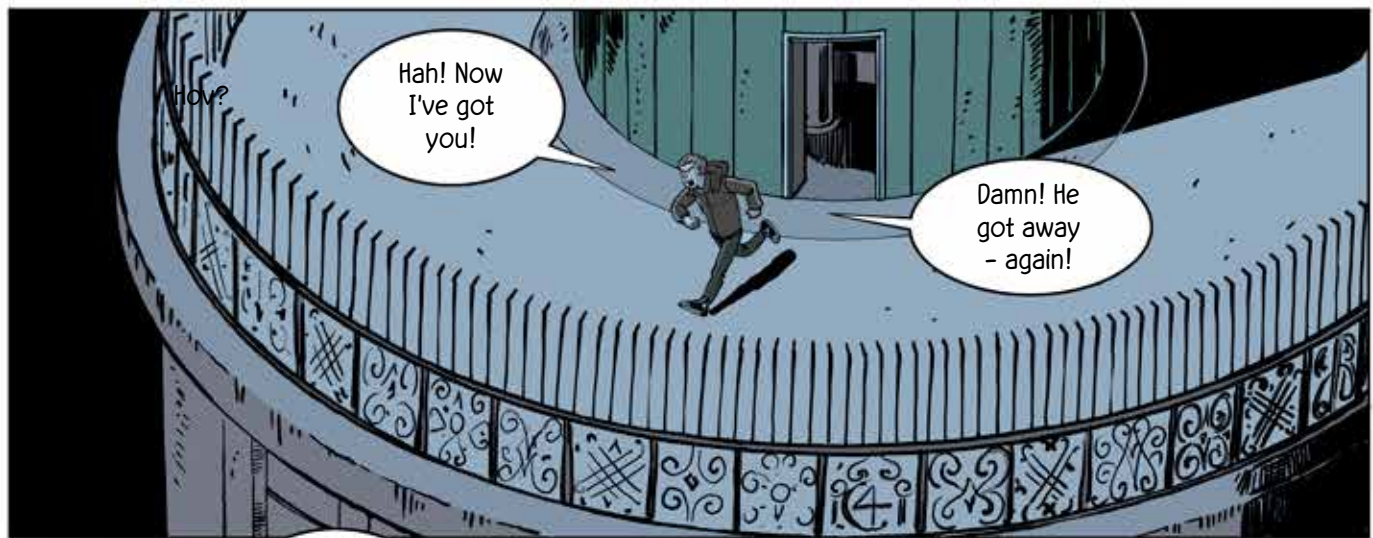




So long, my friend!



НАНАНА!



Hah! Now I've got you!

Damn! He got away - again!



Gosh! Did he really take the jump?



Bye! Please come again to one of our evening lectures!

Don't count me in!



We're closing now, young man! You'll have to play tag another day!

Now I'll never find out, who ...



BOK!



Then he WAS up there!



?