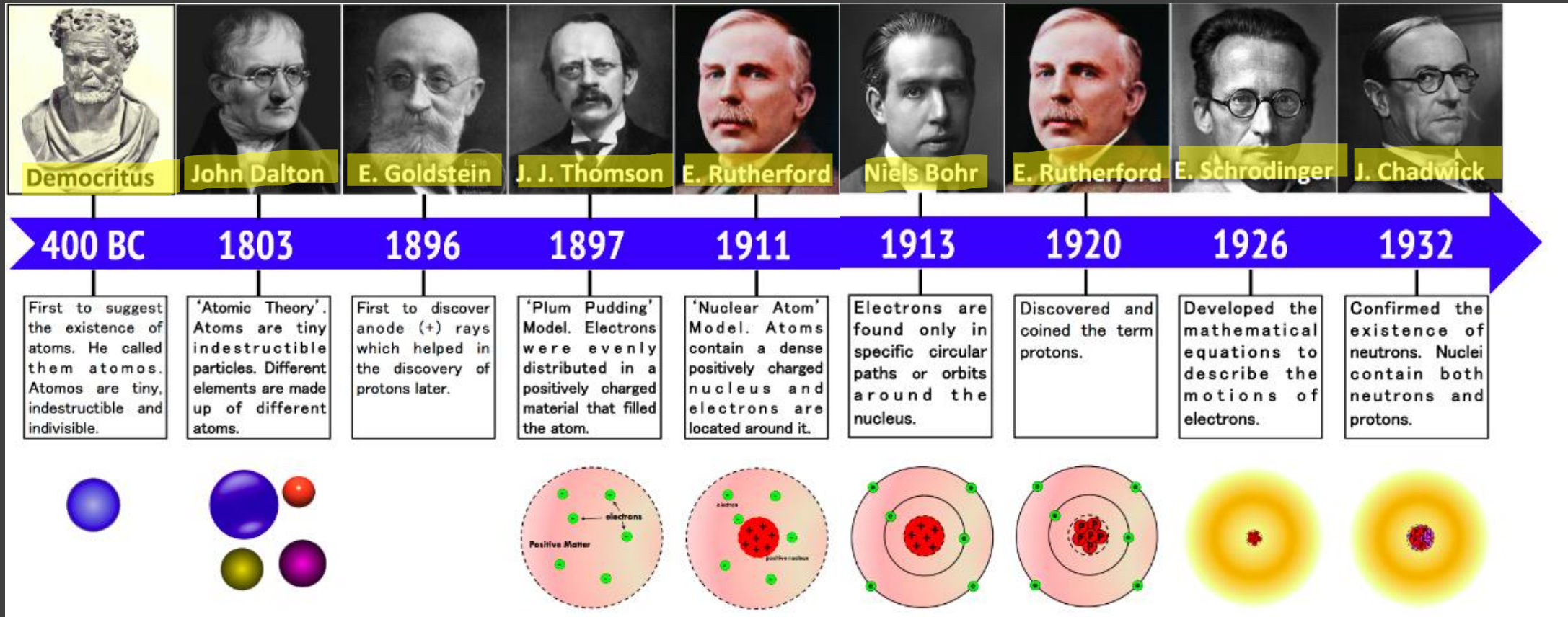
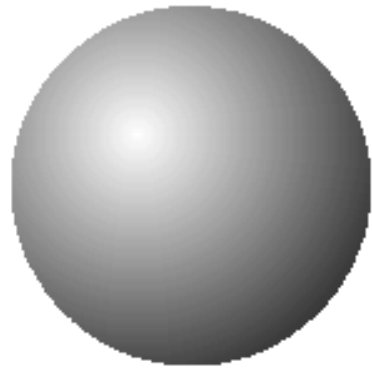
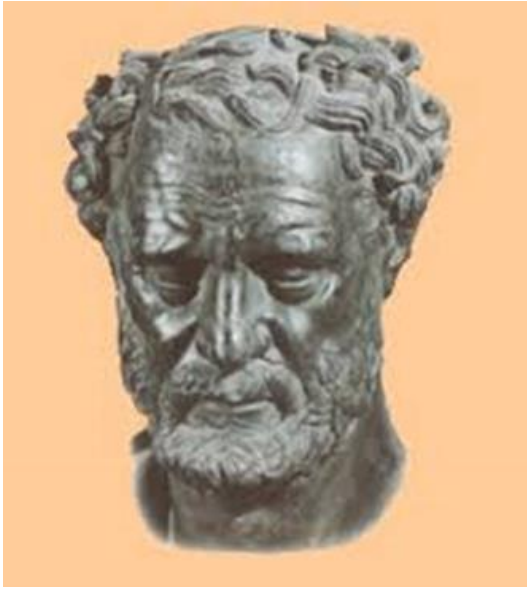




DEVELOPMENT OF ATOMIC THEORIES

TIMELINE OF THE EMERGENCE OF THE ATOMIC STRUCTURE

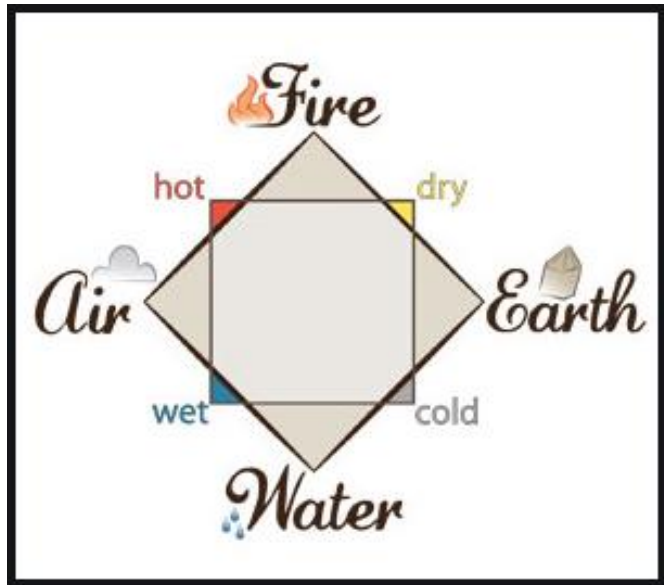
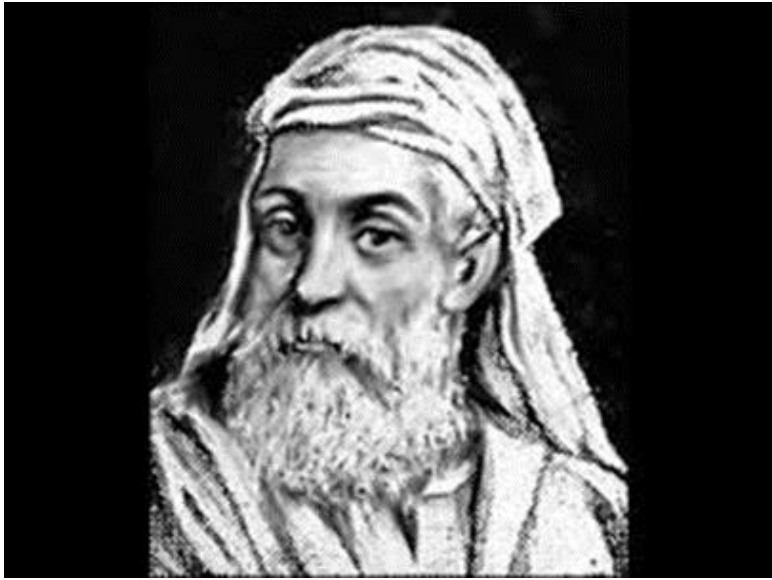




**Democritus
(400 B.C.)**

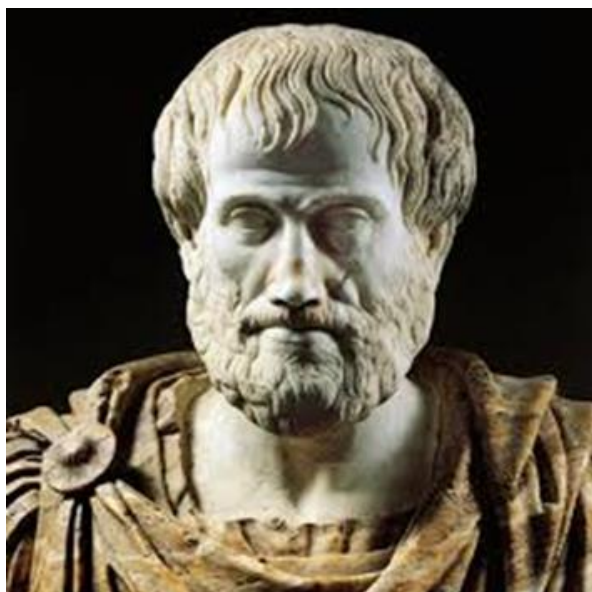
DEMOCRITUS

- Democritus's model stated that **matter consists of invisible particles called atoms** and **a void** (empty space). He stated that atoms are indestructible and unchangeable. Also that they are homogenous, meaning they have no internal structure. His atomic model was solid, and stated **all atoms differ in size, shape, mass,** position and arrangement, with a void exists between them.



EMPEDOCLES

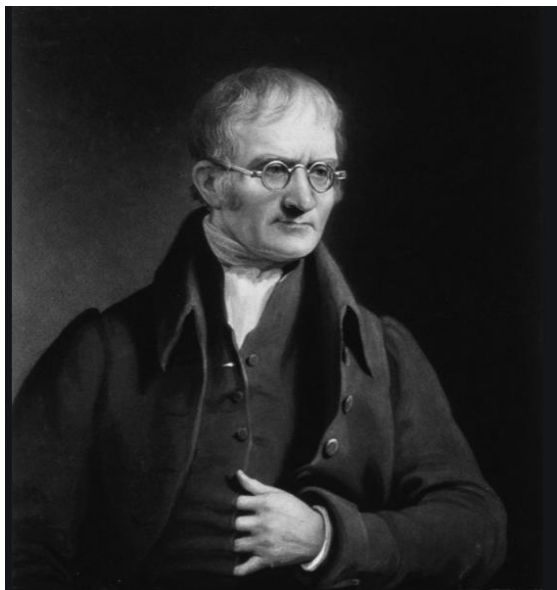
- Empedocles devised the **theory** that all substances are made of four pure, indestructible elements: air, fire, water, and earth. In one sense, it is admirable that **Empedocles tried to simplify our complex world into basic elements.**



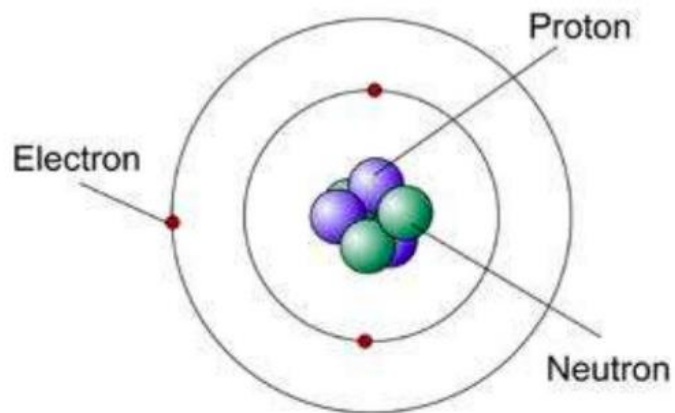
ARISTOTLE

- Aristotle did not believe in the atomic theory and he taught so otherwise. He thought that all materials on Earth were not made of atoms, but of the four elements, Earth, Fire, Water, and Air. He believed all substances were made of small amounts of these four elements of matter.



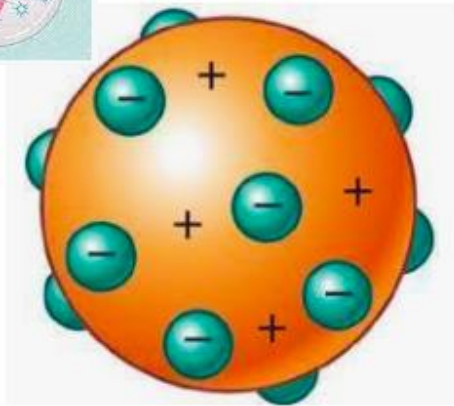
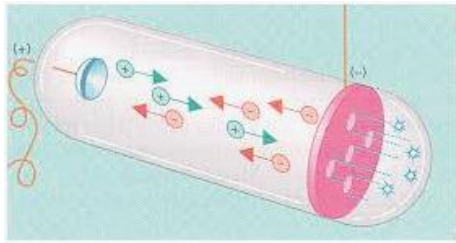
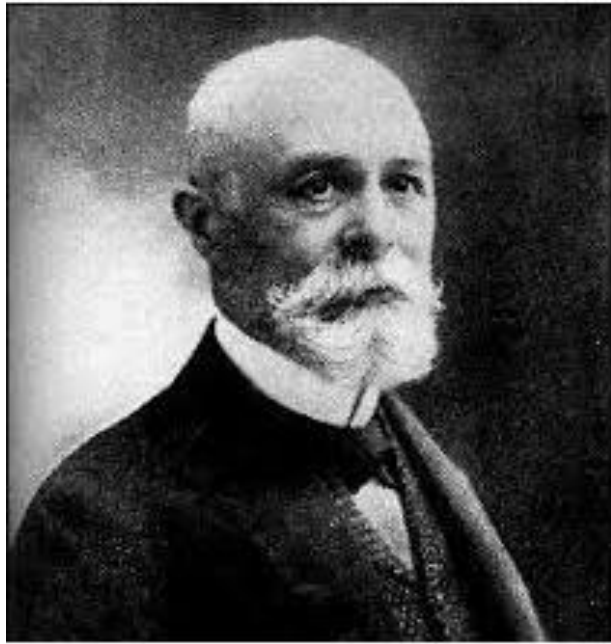


Dalton's atomic model



JOHN DALTON

- Dalton's atomic theory proposed that all matter was composed of atoms, indivisible and indestructible building blocks. While all atoms of an element were identical, different elements had atoms of differing size and mass.



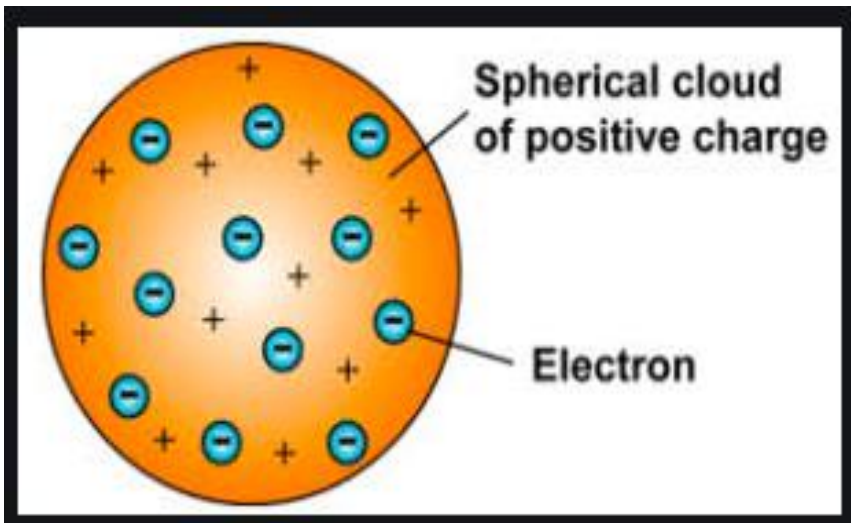
EUGEN GOLDSTEIN

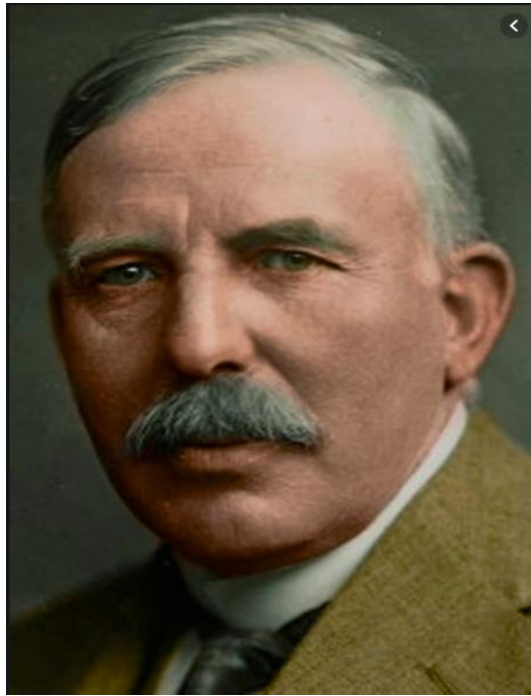
- **Goldstein** contributed greatly to the study of cathode rays. **He discovered protons** with the experiments he did with cathode rays which would knock electrons of **atoms** and attract them to a positively charged electrode.



JOSEPH JOHN THOMSON

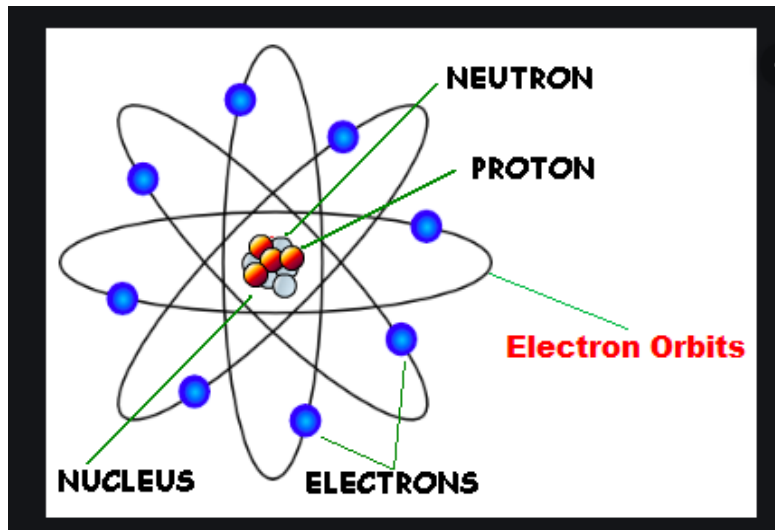
- **J. J. Thomson**, who discovered the electron in 1897, proposed the plum pudding model of the atom in 1904 before the discovery of the atomic nucleus in order to include the electron in the atomic model. In Thomson's model, the atom is composed of electrons (which Thomson still called "corpuscles," though G. J.





ERNEST RUTHERFORD

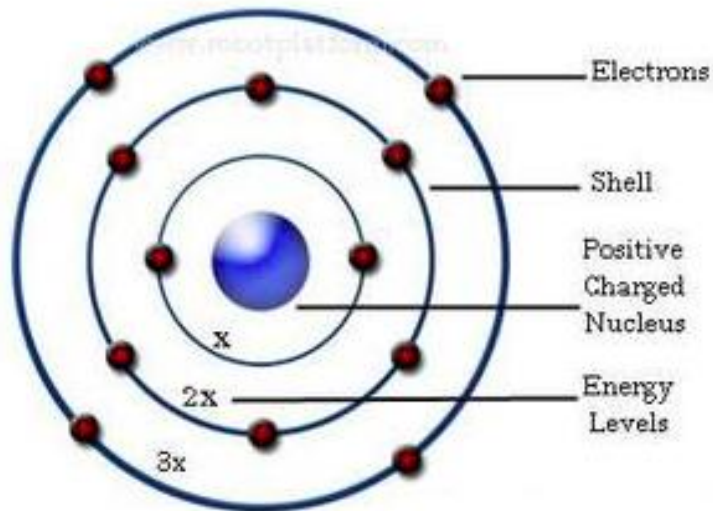
- Rutherford proposed that an atom is composed of empty space mostly with electrons orbiting in a set, predictable paths around fixed, positively charged nucleus.





NEILS BOHR

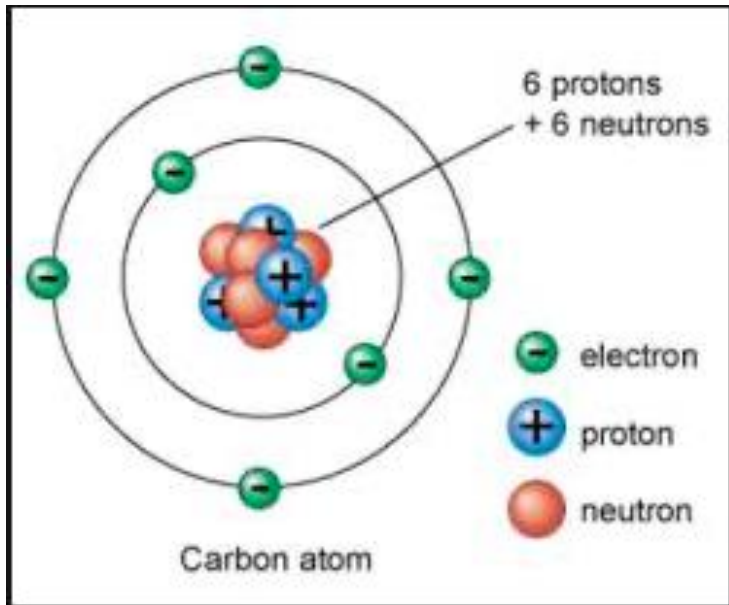
- **Niels Bohr proposed the Bohr Model of the Atom in 1915. ... The Bohr Model is a planetary model in which the negatively-charged electrons orbit a small, positively-charged nucleus** similar to the planets orbiting the Sun (except that the orbits are not planar).





JAMES CHADWICK

- In 1932, **James Chadwick** discovered a third type of sub atomic particle, which he named the neutron.
- Neutrons help to reduce the repulsion between protons and stabilize the atom's nucleus.





ERWIN SCHRÖDINGER

- In 1926 **Erwin Schrödinger**, an Austrian physicist, took the Bohr **atom model** one step further. **Schrödinger** used mathematical equations to describe the likelihood of finding an electron in a certain position. This **atomic model** is known as the quantum mechanical **model** of the **atom**.

The Quantum Mechanical Model

