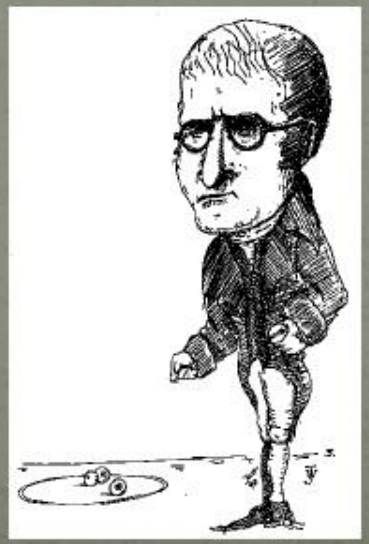
John Dalton

Chemist, Teacher, and Physicist

By: Farkhat Bekhruz

Growing Up

- John Dalton was born to a Quaker family on September 6, 1766 in Eaglesfield, England where he was the youngest of three. (Jonathan, Mary, and John)
- He grew up working in the fields and in his family's shop where cloth was made.
- He attended the local school until the age of 11, and began teaching there at the age of 12.

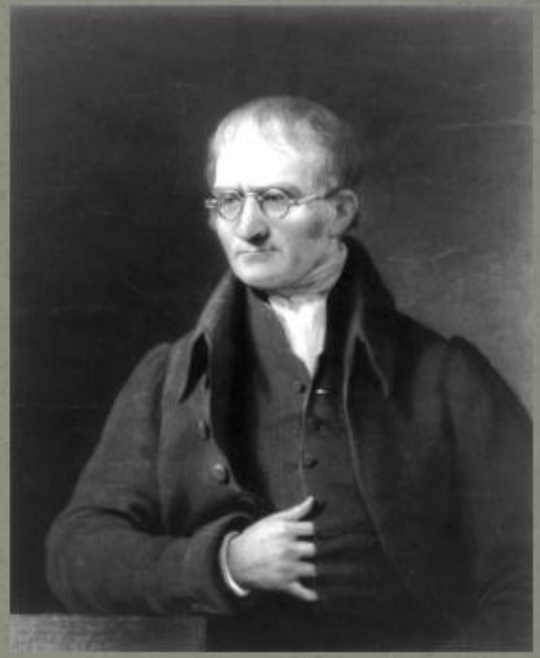


Interest in Science and Math

- John Dalton's interest in math began when he met a teacher at his school named John Fletcher.
- John Fletcher had him solve math problems and saw that there was something special in John Dalton because he learned very quickly and was very good at it.

Interest in Science and Math

- John Dalton's interest in science began when Elihu Robinson approached him after noticing him while John Fletcher was teaching him.
- Elihu Robinson mentored him in math, science and meteorology.



Starting a School

- At the age of 15, John Dalton and his brother decided that they wanted to open a school that focused mostly on math and science.
- The opened a school in their town but it did do very well so they decided to move to Kendal, England and opened a school there.
- At there school in Kendal they offered many language classes, and more than 21 math and science classes.
- Even though they had many students attend they had to close it down because there was not enough money to keep it open.

Meteorology

- Because of Dalton's lifelong interest in meteorology he came up with some of science's most important concepts.
- John began recording the weather in journals, after his school was closed, everyday for the rest of his life.
- Because of his records he began noticing weather patterns and studying atmospheric pressure, temperature, wind, and humidity.

Some of Dalton's Contributions to Science

- Dalton's Law of Particle Pressure

The pressure of a mixture of gases is equal to the sum of the pressures of all of the constituent gases alone.

Formula

$$Pressure_{Total} = Pressure_1 + Pressure_2 + Pressure_3 \ldots\ldots$$

$$P = P_1 + P_2 + P_3 + \ldots$$

Some of Dalton's Contributions to Science

- Law of the Thermal Expansion of Gases

The heating and cooling of gases results from the compression and expansion of the gas.

Greatest Contributions to Science

- Dalton's Atomic Theory
  - Published this theory in his book *New System of Chemical Philosophy* in 1808.
- Daltonism (Color Blindness)

Dalton's Atomic Theory

1. All matter is composed of extremely small particles called atoms.
2. Atoms are indivisible and indestructible.
3. Atoms of a given element are identical in size, mass, and chemical properties.
4. Atoms of a specific element are different from those of another element.
5. Different atoms combine in simple whole number ratios to form compounds.
6. In a chemical reaction, atoms are separated, combined or rearranged

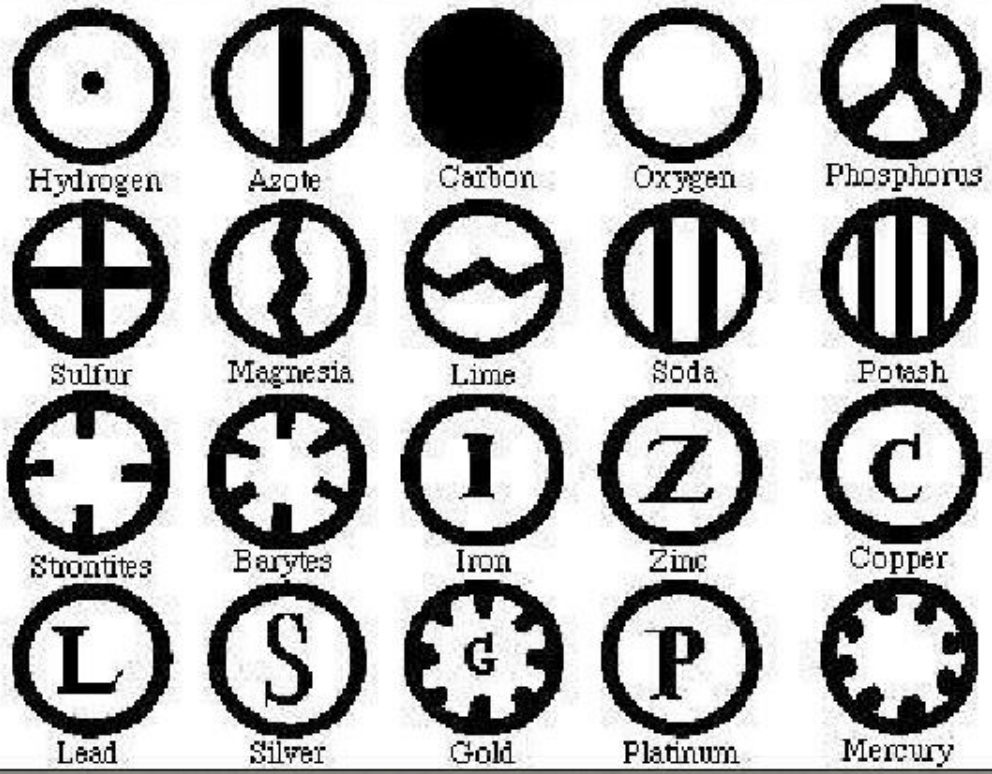
Some incorrect Information

- John Dalton's Theory provided the information for what is now the current atomic model of matter.
- Some of the parts of his theory were wrong though.

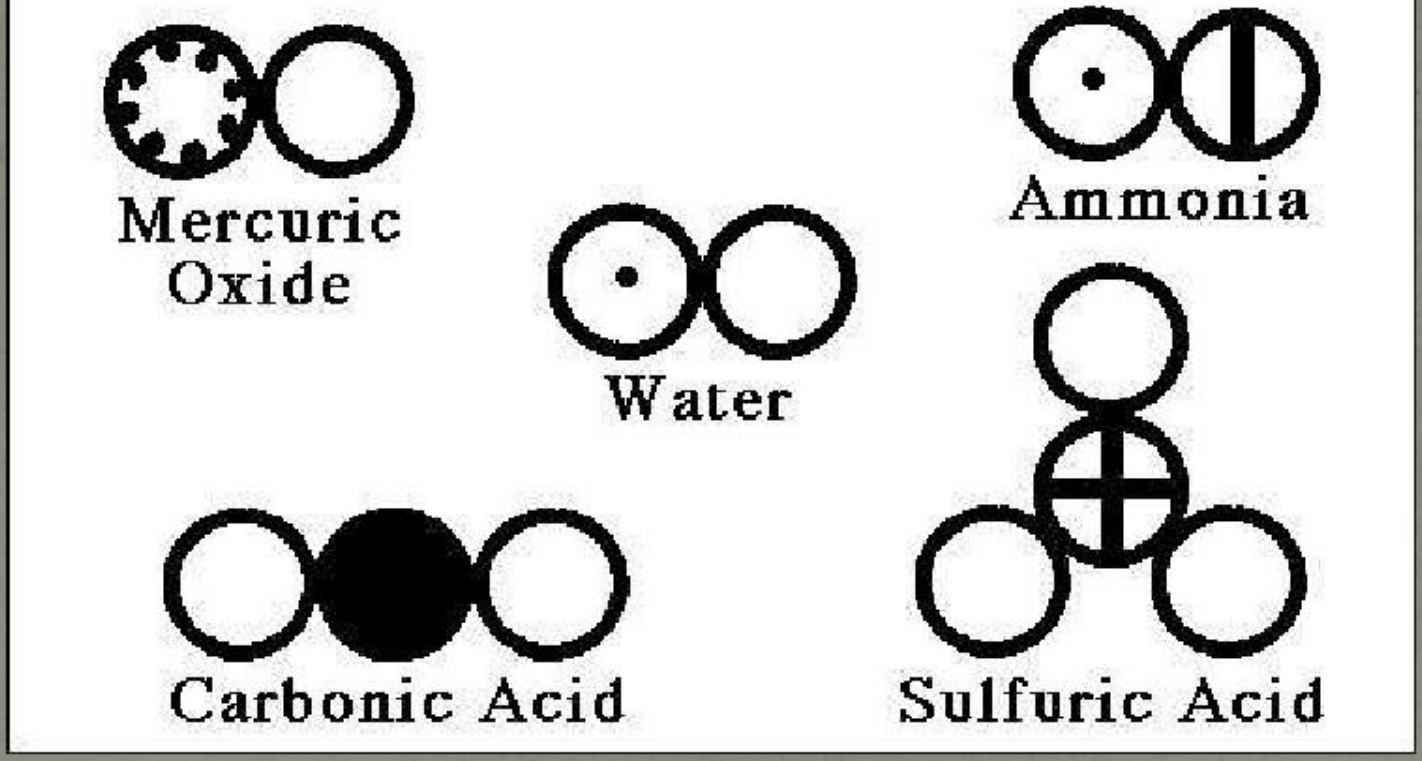
For example

- Atoms being indivisible. Atoms are divisible into several subatomic particles.
- All atoms of a given element having identical properties. Atoms of the same element can have slightly different masses.

Dalton's Atomic Theory



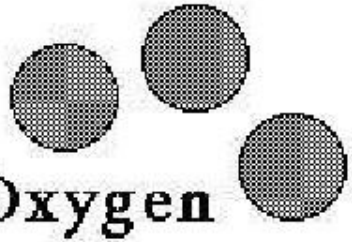
Dalton's Atomic Theory



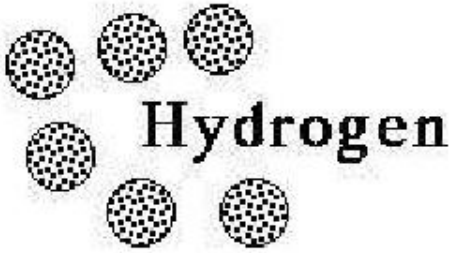
Dalton's Atomic Theory and Elements and Compounds

Elements

Made of one kind of atom



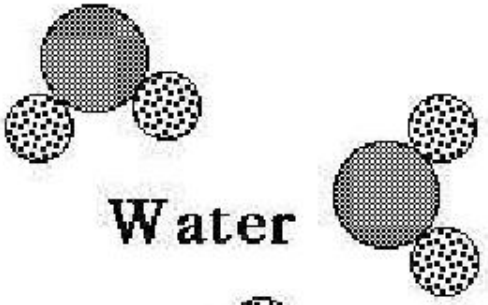
Oxygen



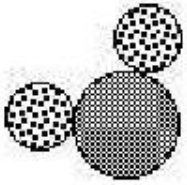
Hydrogen

Compounds

Made of two or more kinds of atoms



Water

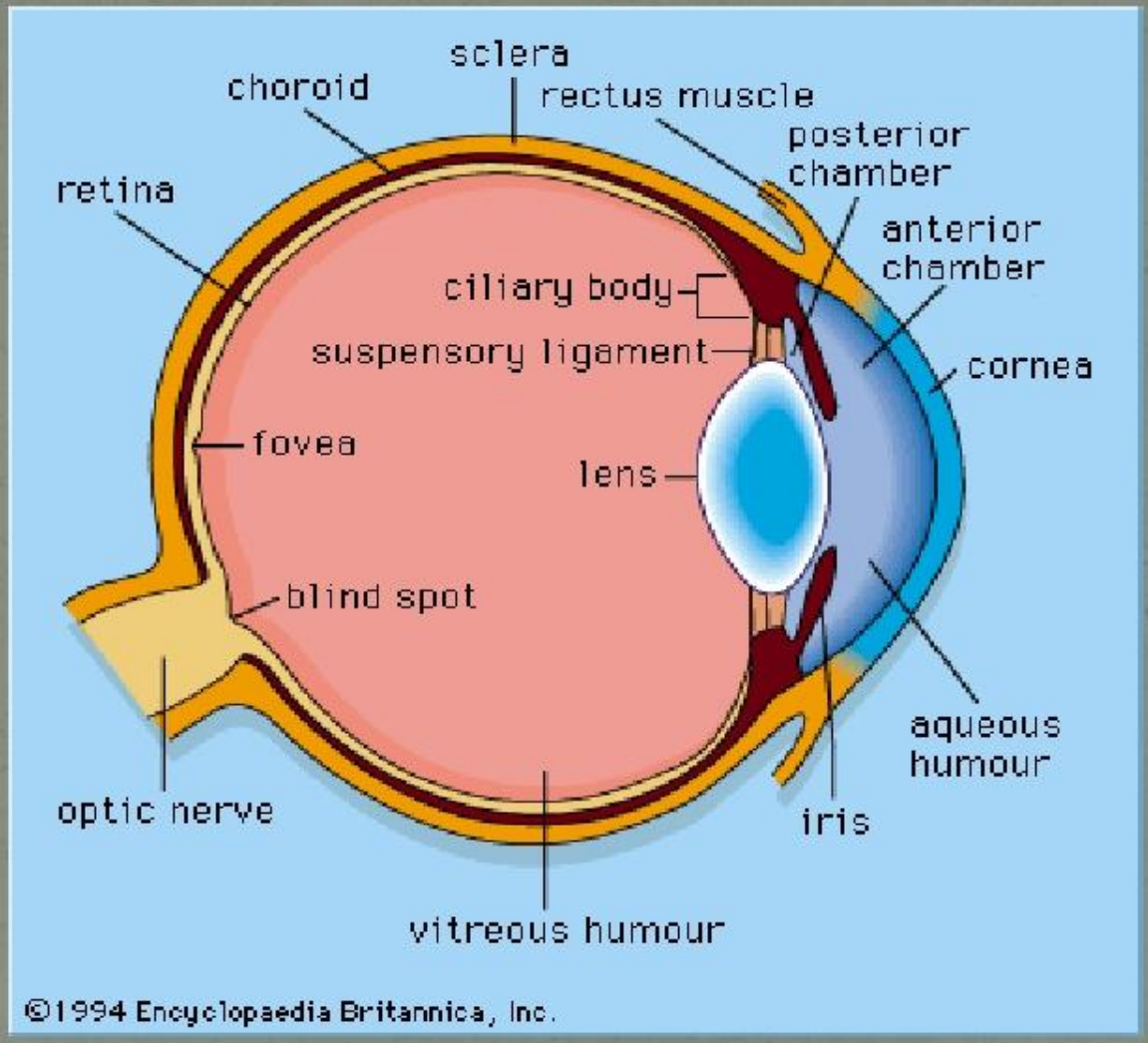


Daltonism (Color Blindness)

- John Dalton published the first scientific paper on Color Blindness in 1798 called, *Extraordinary facts relating to the vision of colours*.
- He began studying about this because he and his brother were noticing that they could not make out the colors red or green.
- "That part of the image which others call red appears to me little more than a shade or defect of light. After that the orange, yellow and green seem one colour which descends pretty uniformly from an intense to a rare yellow, making what I should call different shades of yellow"

Daltonism (Color Blindness)

- Because of Dalton's work, the condition was often called Daltonism.
- Daltonism is now used as another name for a type of color blindness called *deuteranopia*, which is the colorblindness of red-green.
- He hypothesized that he could not make out the colors because of the discoloration of the *aqueous humour*. He believed that the aqueous humour was bluish and therefore filtered out all the colors.
- One of his last wills was to get an autopsy of his eyes after death. Unfortunately there wasn't any bluish liquid found.


sclera
choroid
rectus muscle
posterior chamber
retina
anterior chamber
ciliary body
suspensory ligament
cornea
fovea
lens
blind spot
aqueous humour
optic nerve
iris
vitreous humour
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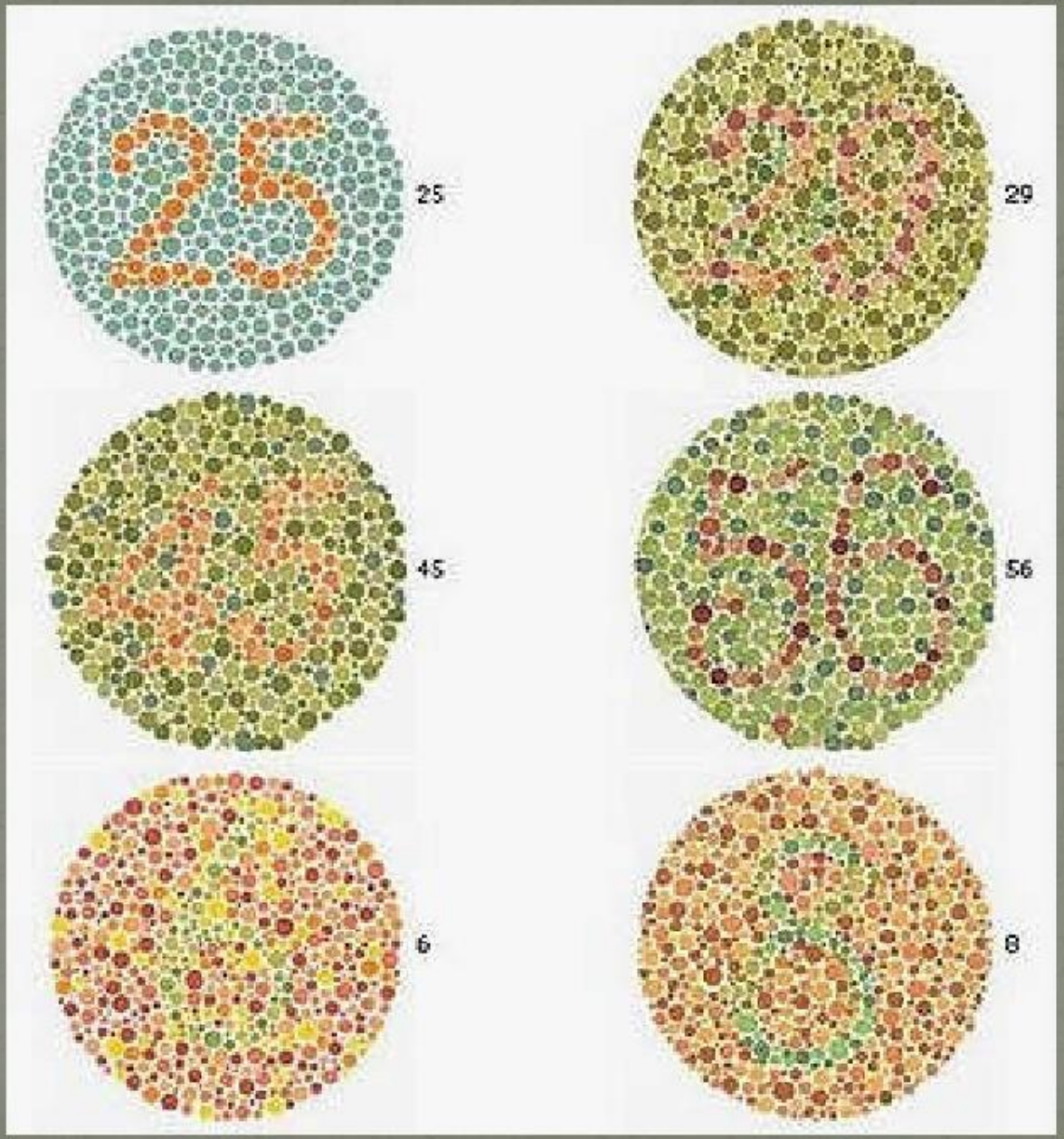
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Historical Background of the Period

- Age of Enlightenment
  - Movement that emphasized the use of reason and the scientific method as means of obtaining knowledge.
- This movement spread all through Europe and the new colonies.
- People started to look more into the observations of Copernicus, Galileo, and Sir Isaac Newton.
- They also determined the world was heliocentric, Earth revolves around the Sun.

Reference Page

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- Спасибо за внимание
- Назарларыңызға рахмет