

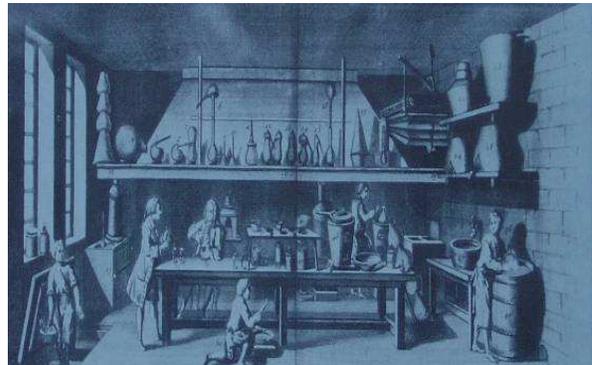
The Museum of the History of Science

Discovering the Basement Gallery

The Basement Gallery contains objects from the nineteenth century when subjects like 'chemistry' and 'physics' became distinct areas of science. Use this sheet to help you discover what's on display.

1. The lower floor of the museum was originally used as a chemistry **laboratory** in **1683**. It was full of big furnaces and there was always the danger of fire or explosions!

Near the entrance to the gallery there is a cabinet with some objects found behind the museum by archaeologists. What kinds of objects can you see that could have been used in a laboratory?



An eighteenth century laboratory was not always a safe place to be!

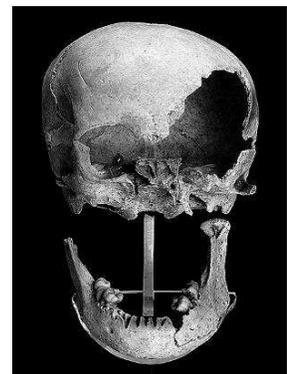
$$D^2 = \frac{KQ}{3} \frac{P_0 - P}{T_0} \sim \frac{1}{2} k_e \quad (2a)$$
$$D^2 \sim 10^{-53}$$
$$e \sim 10^{-26}$$

3. See if you can find the object which contains the notation above. Which famous scientist wrote this?

2. Behind the laboratory was a small **anatomy room** where bodies may have been dissected. This was illegal then in England, but sometimes the authorities would give permission for the corpse of an executed criminal to be used to satisfy scientific curiosity! Look at the skulls in the cabinet. Can you see any signs of an unusual operation in the back of a skull? What do you think this treatment was for?

4. In the middle of the gallery is a large cabinet. It houses a giant **lodestone** or piece of magnetised rock. What is a lodestone? (Clue: Look closely at what it does)

Such large stones were highly valued as objects of curiosity. Can you imagine why they were so fascinating to people?



5. Look at the cabinet called '*Natural Philosophy*'. Before the word '**scientist**' was used, people who were interested in how the physical world works were often called '**natural philosophers**'. Science was thought of as a branch of philosophy.

How would you explain what 'natural philosophy' was?

Can you find an '**Archimedes Screw**'? What did this do?

6. In the corner nearby you will find '*The Experimental Cabinet*'. This contains instruments used in popular demonstrations and scientific shows. **Electricity** was a very popular theme for these shows.

See if you can find the '**Lightning House**'. What happened to the figures when an electrical charge was given to the lightning conductor?



7. This **electrical cannon** is also in the '*Experimental Cabinet*'.

How do you think it works?

Lightning destroyed many buildings in the past. The problem was solved by the invention of the **lightning conductor** by Benjamin Franklin in 1750.

8. Find the large electrical machine with two glass plates which were rotated by a handle. The machine generated electrical charge by **friction**.

What materials are rubbing together and where? _____

How does this create electricity?

9. Find the cabinet labelled '*Pneumatic Chemistry*'.

Modern chemistry only really started in about 1800 when lots of new **elements** like oxygen and hydrogen were discovered.

But several methods for **separating** substances had already been discovered before this.

What methods of separation can you see here?

10. Find the cabinet labelled '*Chemistry at Oxford*'.

This shows some objects first used in making a very important modern medicine.

What was this medicine and why was it important?

Two Oxford scientists worked hard during the Second World War to find a way of making it from a mould. How did they grow the mould?



Model showing the structure of penicillin

11. Beside the *'Science at Oxford'* cabinet is a cabinet called *'Medicine and Surgery'*.

Surgery didn't really change much until the introduction of **anaesthetics**. Before this, surgical operations were a last resort and pretty horrific!

The knives in the **amputation set** were used to cut through skin and flesh. What do you think they used to cut the bone?

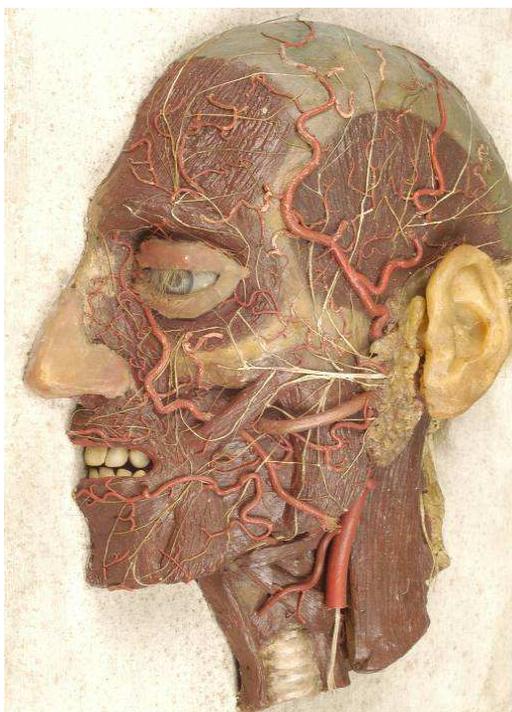
Can you find an **artificial limb** here? What do you think it is made of?



12. **Bloodletting** (bleeding the patient) was also a common treatment in the past. The idea was that it would release bad **'humours'** from the body. Which of the objects on display were used for bleeding?

13. In the sixteenth century many English doctors and surgeons visited universities in Italian cities like **Padua** to learn about **anatomy**. Wax models were often used to help them learn.

What does this wax model of the face on display show?



15. This cabinet also contains several examples of the popular **'Culpeper'** compound microscope.

What materials were used to make these microscopes?

Why was it called a **compound** microscope?

16. In the **Photography** cabinet you will find the camera and equipment used by **Lewis Carroll** who wrote *'Alice in Wonderland'*.

Look out for a **'magic lantern'** was. What was it for? _____