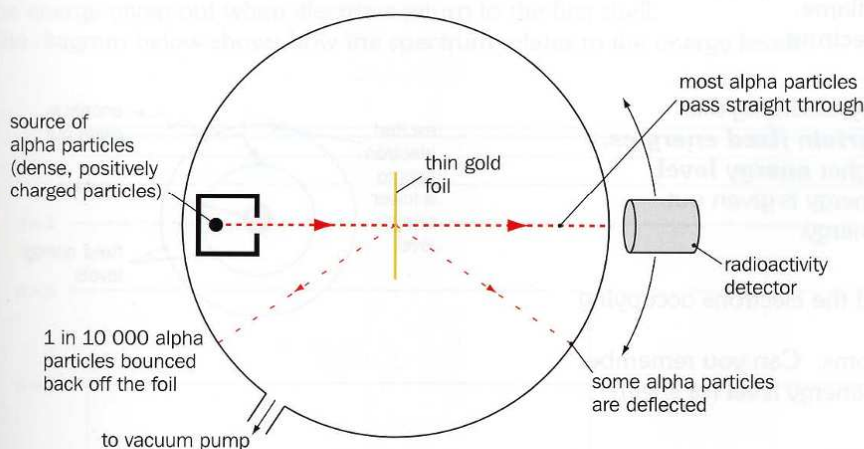


Ernest Rutherford experiment

Extract from "Advanced chemistry for you", Lawrie RYAN, Nelson Thornes

The discovery of radioactivity at this time was important. It gave scientists a new way to probe inside atoms. In 1909 two students working with **Ernest Rutherford** did an experiment that would again change the way we think about atoms. The students at Manchester University fired heavy radioactive particles (alpha particles) at a very thin gold foil. They expected the alpha particles to crash straight through the foil. After all, the atoms were thought to be mainly clouds of charge.

Can you imagine their surprise when some of the alpha particles were deflected? A few even bounced back off the atoms! Their experiment is shown below:



Rutherford explained their results by suggesting a new model of the atom. He thought that the positive charge was not spread out in a cloud, as in the Plum Pudding theory. He believed that all the positive charge was packed into a very small, incredibly dense **nucleus** at the **centre of the atom**. So if one of the positively charged alpha particles struck the nucleus of an atom head on, it would be repelled away. (See the diagram on page 18.)

But what about the electrons? Rutherford pictured them as flying around the nucleus at high speeds. Look at his idea of the structure of an atom below:

