



## CHAPTER 2: THE STRUCTURE OF THE ATOM



### Extra Info

#### Radiocarbon dating

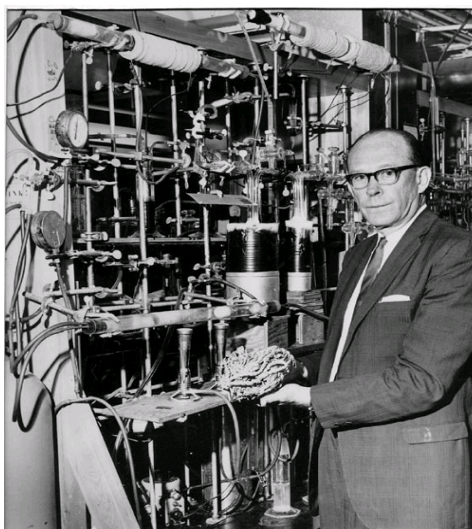
Isotope carbon -14 ( $^{14}\text{C}$ ) is widely used to determine the age of antiques, artefacts and archaeological specimens. This technique of using carbon -14 is known as **radiocarbon dating**. It is used to determine the age of archaeological specimens up to about 60,000 years old.

Living things such as plants and animals are made mainly of carbon. Plants take in carbon dioxide for photosynthesis, some animals eat plants, and some animals eat other animals in a food chain. Carbon moves along this pathway through food chains because all living things use carbon for building their bodies until they die.

Carbon-14 is radioactive. This means that its atomic structure is not stable. Particles are emitted from the nucleus of the carbon -14 atom, and the atom becomes stable. Radioactivity decreases with time. Scientists measured the half-life of radiocarbon. The half-life refers to the length of time it takes for half the radiocarbon in a sample of materials to disappear.

Carbon is very common on Earth. Thus, there are many different types of materials which can be dated by this technique. Some examples of materials which can be dated are given below.

- Wood
- Bone
- Leather
- Soil
- Hair
- Bird eggshells
- Blood residues
- Textiles and fabrics
- Fish remains
- Insect remains



*Dr. Willard Libby and his equipments in a lab*

The technique of radiocarbon dating was discovered by Dr. Willard Libby and his colleagues in 1949. He was awarded the Nobel Prize in chemistry for this work in 1960.