

Although Robert Hooke had discovered 'cells' in 1665, he did not understand the importance of his discovery. At that time, scientists knew that organisms were made of tissues and organs but they thought that these were not living. It was believed that only a whole organism was living, and that the parts that made it were not!

By the end of the eighteenth century, microscopes had improved so much that scientists were able to see cells in plants. Plant cells were much easier to see than animal cells because of their thick cell walls. Cell surface membranes, separating individual animal cells, were too thin to be seen. Microscopes continued to become more powerful and, in 1831, Robert Brown discovered a small, dark structure in each plant cell which he called a nucleus (after the Latin for 'small nut', which is what he thought it looked like).

In 1838 the importance of cells became clearer, when Mattias Schleiden came to the conclusion that all plants were made of cells. The next year another scientist, Theodor Schwann, discovered that all animals were also made from cells and that all living things started from one cell. However, he thought that new plant cells sprouted off from other cells. It was not until 1875 that Walther Fleming disproved this idea and discovered how cell division occurs, with a cell splitting into two, down the middle. Walther Fleming also developed the idea of staining cells so that he could see them better.

This century, scientists have discovered a great deal about cells and how they work, using the electron microscope which can see things in much more detail ever before.



- 1 In which year did Robert Hooke discover cells?
- 2 a Explain what the word 'tissue' means today.
b How does your answer to part a differ from what scientists thought in the seventeenth century?
- 3 At the start of the second paragraph it says 'By the end of the eighteenth century, microscopes had improved so much ...' In what way do you think they 'improved'?
- 4 Why did scientists find cells in plants before finding them in animals?
- 5 What job of cell surface membranes is referred to in the text?
- 6 Who discovered the nucleus?
- 7 When did Theodor Schwann say that animals were made up of cells?
- 8 Draw a diagram to show how Theodor Schwann thought a new plant cell would be made.
- 9 Name a stain that Walther Fleming might have used.



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