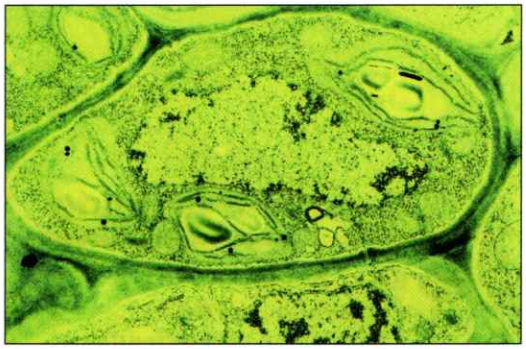

(magnification: 12,000×)

▲ **Figure 7–2** The cell theory states that cells are the basic units of all living things. This cell is from a plant leaf. Compare this micrograph with Hooke's drawing in **Figure 7–1.**

**The Cell Theory** Soon, numerous observations made it clear that **cells** were the basic units of life. In 1838, German botanist Matthias Schleiden concluded that all plants were made of cells like the one in **Figure 7–2.** The next year, German biologist Theodor Schwann stated that all animals were made of cells. In 1855, the German physician Rudolf Virchow concluded that new cells could be produced only from the division of existing cells. These discoveries, confirmed by other biologists, are summarized in the **cell theory,** a fundamental concept of biology. **The cell theory states:**

- **All living things are composed of cells.**
- **Cells are the basic units of structure and function in living things.**
- **New cells are produced from existing cells.**

## Exploring the Cell

Following in the footsteps of Hooke, Virchow, and others, modern biologists still use microscopes to explore the cell. However, today's researchers use microscopes and techniques more powerful than the pioneers of biology could have imagined. Researchers can use fluorescent labels and light microscopy to follow molecules moving through the cell. Confocal light microscopy, which scans cells with a laser beam, makes it possible to build three-dimensional images of cells and their parts. High-resolution video technology makes it easy to produce movies of cells as they grow, divide, and develop.

# Biology and History

## The History of the Cell

*The observations and conclusions of many scientists helped to develop the current understanding of the cell.*

**1665**
**Robert Hooke**
Hooke publishes his book *Micrographia,* which contains his drawings of sections of cork as seen through one of the first microscopes.

**1674**
**Anton van Leeuwenhoek**
Leeuwenhoek observes tiny living organisms in drops of pond water through his simple microscope.

1600 1700 1800