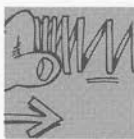


## Waves and Particles



### CHAPTER 14 Making Waves



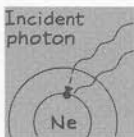
### CHAPTER 15 Waves: Sound and Electromagnetic



### CHAPTER 16 Interference and Diffraction



### CHAPTER 17 Wave-Particle Duality



### CHAPTER 18 Light, Quanta, and Atoms

How is energy transferred? By the twentieth century, physicists felt they had observed two processes: particles and waves. Particles transfer energy when they make contact with one another, like a car colliding with a tree. Waves transfer energy through the motion of a disturbance through a medium, like a wave moving across the lake. Phenomena could be placed neatly in one category or another. Billiard balls are particles; sound is a wave. Electrons are particles; light is a wave.

As physicists began investigating the interactions between light and matter, the distinctions between the two models began to blur. Light, thought to be a wave, could display particlelike characteristics. Electrons, thought to be particles, could display wavelike characteristics. Mutually exclusive models suddenly stood side by side—dual participants in our explanations of phenomena. Current models of the atom provide insight into how physicists have reached peace with wave-particle duality.